SOIL SURVEY OF

Appling and Jeff Davis Counties, Georgia

United States Department of Agriculture
Soil Conservation Service
In cooperation with
University of Georgia, College of Agriculture
Agricultural Experiment Stations

Major fieldwork for this soil survey was done in the period 1963 through 1968. Soil names and descriptions were approved in 1969. Unless otherwise indicated, statements in the publication refer to conditions in the counties in 1968. This survey was made cooperatively by the Soil Conservation Service and the University of Georgia, College of Agriculture, Agricultural Experiment Stations, as part of the technical assistance furnished to the Altamaha Soil and Water Conservation District.

Copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, USDA, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms and woodlands; in selecting sites for roads, ponds, buildings, or other structures; and in appraising tracts of land for agriculture, industry, or recreation.

Locating Soils

All of the soils of Appling and Jeff Davis Counties are shown on the detailed map at the back of this survey. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with numbers shown on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information in the survey. This guide lists all the soils of the counties in alphabetic order by map symbol. It shows the page where each soil is described and gives the capability unit and woodland suitability group in which each soil has been placed.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the sections that discuss management of the soils for crops, pasture, and woodland.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the counties are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife."

Community planners and others concerned with suburban development can read about the soil properties that affect the choice of homesites, industrial sites, and recreational areas in the section "Use of the Soils for Town and Country Planning."

Engineers and builders can find, under "Use of the Soils for Engineering," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices and structures.

Scientists and others can read about how the soils were formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Appling and Jeff Davis Counties may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section, "Additional Facts about the Counties."

***Cover:* A natural stand of slash pine on Leefield loamy sand. Gum for turpentine is taken from these trees.**

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SOIL SURVEY OF APPLING AND JEFF DAVIS COUNTIES, GEORGIA

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UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE, IN COOPERATION WITH THE UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE, AGRICULTURAL EXPERIMENT STATIONS

APPLING AND JEFF DAVIS COUNTIES occupy 539,584 acres in the southeastern part of Georgia (fig. 1). Baxley, the county seat of Appling County, is near the center of the county along U.S. Highway 341. Hazlehurst, the county seat of Jeff Davis County, is in the northern part of the county along U.S. Highway 341. The counties are bordered on the north by the Altamaha and Ocmulgee Rivers.

Appling and Jeff Davis Counties are within the Southern Coastal Plain and Atlantic Coastal Flatwoods Major Land Resource Areas. The soils of the Southern Coastal Plain occur in the largest areas north of Baxley and Hazlehurst. These soils are chiefly well drained and deep. They are gently to strongly sloping soils on irregular ridges. They have a sandy surface layer and a sandy, fine loamy, or clayey subsoil. In the Atlantic Coastal Flatwoods, much of the area is low and flat and streams are wide and sluggish. During rainy periods, the water table rises sharply and water remains on or near the surface for long periods. The soils are moderately well drained to very poorly drained, but most of them are somewhat poorly drained. They have a sandy surface layer and generally a sandy to loamy subsoil, though some are sandy throughout.

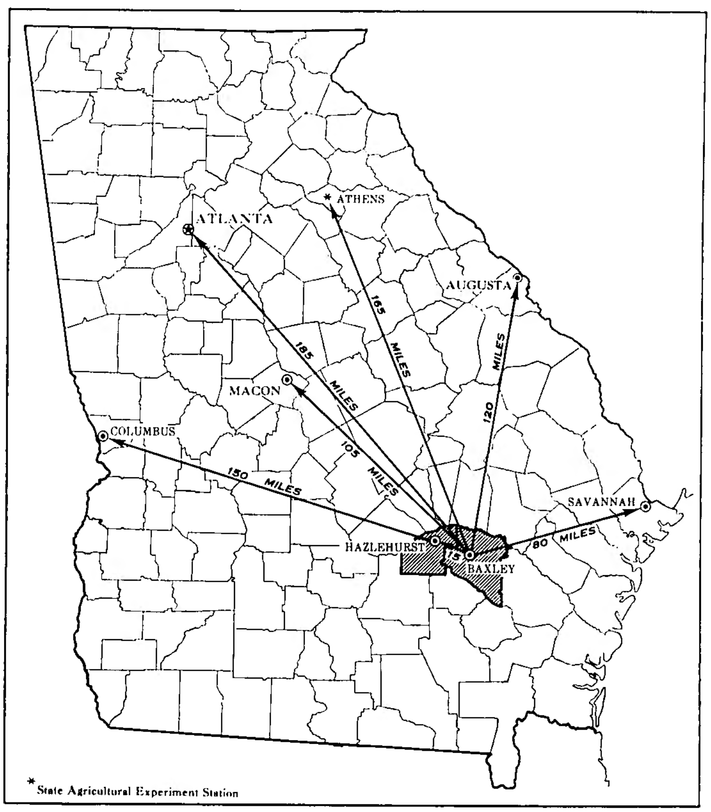

Figure 1.—**Location of Appling and Jeff Davis Counties in Georgia.**

About 70 percent of the total land area in Appling and Jeff Davis Counties is woodland made up of pines and mixed hardwoods. Pulp and paper companies hold large acreages that they manage and protect.

General farming and the production of naval stores and pulpwood are the main agricultural enterprises in the two counties, but there are a few dairy and beef cattle farms. The principal crops are tobacco, corn, cotton, and small grains.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Appling and Jeff Davis Counties, where they are located, and how they can be used. The soil scientists went into the counties knowing they likely would find many soils they had already seen, and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They

classified and named the soils according to nationwide, uniform procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Norfolk and Tifton, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface layer and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Tifton loamy sand, 0 to 2 percent slopes, is one of several phases within the Tifton series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series or of different phases within one series. Two such kinds of mapping units are shown on the soil map of Appling and Jeff Davis Counties: soil complexes and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Troup-Wicksburg complex, 8 to 12 percent slopes, is an example.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Wahee and Coxville soils is an example.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for all the soils.

But only part of a soil survey is done when the soils have been named, described, and delineated on the map and the laboratory data and yield data have been assembled. The mass of detailed information then needs to be organized in such a way as to be readily useful to different groups of users, among them farmers, managers of woodland, and engineers.

On the basis of yield and practice tables and other data, the soil scientists set up trial groups. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. Then they adjust the groups according to the results of their studies and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under present methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Appling and Jeff Davis Counties. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in an area, who want to compare different parts of an area, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not suitable for planning the management of a farm or field or for choosing the exact location of a road or building or other structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

Soil associations and delineations on the general soil map in this soil survey do not fully agree with those of the general soil maps in adjacent counties published at a different date. Differences in the maps are the result of improvements in the classification of soils, particularly in the modifications or refinements in soil series concepts. In addition, more precise and detailed maps are needed because the uses of the general soil maps have expanded in recent years. The more modern maps meet this need. Still another difference is caused by the range in slope that is permitted within associations in different surveys.

The seven soil associations in Appling and Jeff Davis Counties are discussed in the following pages. More detailed information about the soils is given in the section "Descriptions of the Soils."

1. *Kershaw-Troup association*

Excessively drained to well-drained soils that are sandy to a depth of 4 to 5 feet; underlying layers are sandy to loamy; on ridgetops and side slopes

This association consists of very gently sloping to sloping soils that have slopes mainly of 2 to 8 percent. It lies mostly in narrow bands on the eastern side of Hurricane and Satilla Creeks. The association makes up about 1 percent of Appling and Jeff Davis Counties.

The Kershaw soils make up about 80 percent of this association; the Troup soils, about 15 percent; and minor soils, the rest.

The Kershaw soils are undulating and excessively drained. Typically, their surface layer is very dark gray sand about 2 inches thick. Below this, to a depth of about 36 inches, is yellowish-brown sand. Pale-brown sand is between depths of 36 and about 72 inches.

The Troup soils are on ridges and side slopes and are well drained to somewhat excessively drained. Typically, they consist of sand to a depth of about 50 inches. The sand is dark gray in the upper part, yellowish brown and light olive brown in the middle part, and light yellowish brown in the lower part. The next layer is mainly brownish-yellow loamy sand and sandy loam about 9 inches thick. Between depths of 59 and 80 inches is brownish-yellow sandy clay loam that is mottled with shades of red and brown.

Minor soils in this association are the poorly drained Pelham soils and the well-drained Cowarts and Wicksburg soils.

About 90 percent of this association is under a sparse stand of pines and low-grade hardwoods. A few areas of the Troup soils have been cleared and are cultivated. Because the soils of the association are sandy and droughty, crop response is poor. Nevertheless, bermudagrass, bahiagrass, and other pasture grasses can be grown with fair success.

The farms in this association are large, and most of them are tree farms.

This association has slight to severe limitations for uses related to town and country planning.

2. *Troup-Wicksburg association*

Somewhat excessively drained and well-drained soils that are sandy to a depth of 2 to 5 feet; underlying layers are loamy to clayey; on ridgetops and side slopes

This association consists of broad, gently sloping ridgetops, strongly sloping side slopes, and many, small, winding drainageways. About 80 percent of the association has slopes of 0 to 10 percent; the rest is slightly steeper. This association makes up about 24 percent of Appling and Jeff Davis Counties.

The Troup soils make up about 40 percent of the association; the Wicksburg soils, about 25 percent; and minor soils, the rest.

The Troup soils are on ridgetops and side slopes and are well drained to somewhat excessively drained. Typically, these soils consist of sand to a depth of about 50 inches. The sand is dark gray in the upper part, yellowish brown and light olive brown in the middle part, and light yellowish brown in the lower part. The next layer is mainly brownish-yellow loamy sand and sandy loam about 9 inches thick. Between depths of 59 and 80 inches is brownish-yellow sandy clay loam that is mottled with shades of red and brown.

The Wicksburg soils are well drained and occupy parts of the landscape similar to those of the Troup soils. Typically, the surface layer of Wicksburg soils is dark-gray gravelly coarse sand about 5 inches thick. It is underlain by a layer of light olive-brown coarse sand about 19 inches thick. The subsoil, to a depth of about 32 inches, is brownish-yellow coarse sandy loam and yellowish-brown sandy clay. Below this, to a depth of 60 inches, is mottled yellowish-brown, red, light-gray, and white sandy clay.

Minor soils in this association are mainly the poorly drained Rains and Pelham soils, the very poorly drained Johnston soils, and the well-drained Cowarts and Fuquay soils.

About 70 percent of this association is woodland. A few of the smoother areas are in cultivated crops or pasture. Because the soils are sandy and somewhat droughty, crop response is only fair. Nevertheless, Coastal bermudagrass, bahiagrass, and other pasture grasses can be grown if these soils are well managed.

The farms in this association are large, and most of them are tree farms. Some farms used for general farming and raising livestock average about 250 acres in size.

A large part of this association has only moderate or slight limitations for uses related to town and country planning. In the steeper parts and in wet areas, the limitations generally are severe for most nonfarm uses.

3. *Fuquay-Tifton-Pelham association*

Well-drained and poorly drained soils that have a sandy surface layer and dominantly loamy underlying layers; mainly on broad ridges

This association consists of broad, nearly level and very gently sloping ridgetops that have short side slopes along the narrow, winding drainageways. It occurs generally throughout the two counties and makes up about 15 percent of the total acreage.

The Fuquay soils make up about 35 percent of this association; the Tifton soils, about 20 percent; the Pelham soils, about 20 percent; and minor soils, the rest.

The Fuquay soils are on ridges between streams and on hillsides. These soils are well drained. Typically, they have a surface layer of grayish-brown loamy sand that is about 8 inches thick and is underlain by pale-olive and light yellowish-brown loamy sand to a depth of about 22 inches. The subsoil extends to a depth of 63 inches and is mainly yellow and brownish-yellow sandy clay loam. It is mottled in the lower part.

The Tifton soils also are well drained and occupy parts of the landscape similar to those of the Fuquay soils. Typically, the surface layer of Tifton soils is very dark grayish-brown loamy sand about 9 inches thick. The subsoil, to a depth of 34 inches, is yellowish-brown sandy loam and sandy clay loam. Below this, and extending to a depth of 70 inches, the subsoil is strong-brown and brownish-yellow sandy clay loam mottled with shades of red and gray.

The poorly drained Pelham soils are chiefly in level to slightly depressed, wet areas of the landscape. Typically, these soils are loamy sand to a depth of 26 inches. This

material is very dark gray in the upper part, light gray in the middle part, and white in the lower part. The subsoil, to a depth of about 42 inches, is gray sandy loam mottled with yellowish brown and pale yellow. The lower part of the subsoil, to a depth of 60 inches, is mottled gray and yellowish-brown sandy clay loam.

Minor soils in this association are mainly the well drained Norfolk and Carnegie soils and the moderately well drained Irvington soils.

About 55 percent of this association is used for cultivated crops and pasture. The rest is made up of steeper soils and is woodland. Some of the best soils for farming in the two counties are on the smoother uplands of this association. The soils are generally in good tilth and have a deep rooting zone. Crops on these soils respond well to good management. Most of the pasture plants and cultivated crops grown in these counties are suited to these soils. The main crops are corn, cotton, small grain, soybeans, Coastal bermudagrass, and bahiagrass.

The farms in this association average about 150 acres in size, and most of them are operated by their owners. Most farms are of the general type, but some are dairy beef cattle farms.

About 80 percent of this association has only slight to moderate limitations for uses related to town and country planning. Wetness, however, severely limits use of the Pelham soils in the slight depressions and along drainageways.

4. *Irvington-Leefield-Hazlehurst association*

Moderately well drained and somewhat poorly drained soils that have a sandy surface layer and loamy underlying layers; mainly on smooth uplands

This association consists mainly of nearly level uplands, but there are small, rounded, ponded areas of poorly drained soils scattered throughout. This association makes up about 6 percent of Appling and Jeff Davis Counties and is mainly in the southeastern parts of the two counties.

The Irvington soils make up about 30 percent of the association; Leefield soils, about 25 percent; Hazlehurst soils, about 12 percent; and minor soils, the rest.

The Irvington soils are on smooth interstream divides and are moderately well drained. Typically, they have a surface layer of dark grayish-brown loamy sand, about 9 inches thick, that contains few to many, small iron concretions. The upper part of the subsoil is light olive-brown and light yellowish-brown sandy loam and sandy clay loam about 17 inches thick. The lower part of the subsoil is a cemented fragipan that begins at a depth of about 26 inches and extends to a depth of about 60 inches. It consists of light yellowish-brown and light-gray sandy clay loam that is mottled with strong brown, light gray, yellowish red, and red.

The Leefield soils are adjacent to ponded areas and drainageways, and they are somewhat poorly drained. Typically, these soils are loamy sand to a depth of 26 inches. This material is dark gray in the upper part and grayish brown in the lower part. Beneath it is a subsoil of sandy loam and sandy clay loam that extends to a depth of 63 inches. It is mostly pale yellow in the upper part, light gray mottled with shades of yellow and brown in the middle part, and yellowish brown mottled with shades of gray, yellow, and red in the lower part.

The Hazlehurst soils, like the Irvington soils, are on the smooth interstream divides, but they are somewhat poorly drained. Typically, the Hazlehurst soils have a surface layer of dark-gray and light brownish-gray loamy sand about 8 inches thick. It is underlain by about 5 inches of light brownish-gray and dark-gray loamy sand that contains a few iron concretions. The subsoil, to a depth of 63 inches, is sandy clay loam. It is pale yellow and mottled in the upper part, light gray mottled with shades of brown and yellow in the middle part, and yellowish brown mottled with shades of gray and red in the lower part. At a depth of 24 to 30 inches, there are many medium to large concretions of iron, and bodies of plinthite that are weakly cemented.

Minor soils in this association are mainly the poorly drained Pelham soils and the well-drained Tifton soils.

Most of the soils in this association are cultivated. They are some of the better suited soils for locally grown cultivated crops.

The farms in this association average about 150 acres in size and are operated by the owners. Most farming is of the general type, but there are a few poultry farms.

The major soils in this association have mainly moderate to severe limitations for uses related to town and country planning.

5. *Pelham-Leefield-Olustee association*

Poorly drained and somewhat poorly drained soils that have a sandy surface layer and loamy to sandy underlying layers; on low uplands

This association is characterized by broad flats and slight depressions. Slopes range from 0 to 3 percent. This association is in large areas along U.S. Highway No. 341 in Appling County and in the middle and southern parts of Jeff Davis County. It makes up about 49 percent of the two counties.

The Pelham soils make up about 34 percent of the association; the Leefield soils, about 25 percent; the Olustee soils, about 13 percent; and minor soils, the rest.

The Pelham soils are in slight depressions on broad flats and are poorly drained. Typically, these soils are loamy sand to a depth of 26 inches. This material is very dark gray in the upper part, light gray in the middle part, and white in the lower part. The subsoil, to a depth of about 42 inches, is gray sandy loam that is mottled with yellowish brown and pale yellow. The lower part of the subsoil extends to a depth of 60 inches and is mottled gray and yellowish-brown sandy clay loam.

The Leefield soils are on low ridges and are somewhat poorly drained. Typically, they have a surface layer of dark-gray loamy sand over a layer of grayish-brown loamy sand that extends to a depth of about 26 inches. The subsoil, to a depth of 63 inches, is mainly light-gray sandy clay loam that is mottled with shades of brown, yellow, and red.

The Olustee soils are poorly drained and occupy positions on the landscape similar to those of the Leefield soils. Typically, the surface layer of Olustee soils is very dark gray sand about 6 inches thick. It overlies a layer of dark-brown, organically stained, weakly cemented sand about 4 inches thick. Beneath this, to a depth of

about 28 inches, is light yellowish-brown loamy sand that is mottled with white. Between depths of 28 and 60 inches is brownish-yellow sandy loam that is mottled with reddish yellow, white, and strong brown.

Minor soils in this association are chiefly the very poorly drained Surrency and Bayboro soils, the poorly drained Mascotte soils, and the somewhat poorly drained Albany soils. These soils occupy a relatively small but significant acreage.

The only soils in this association that are well suited to farming are the Leefield soils. Suitable crops and pasture plants locally grown are tobacco, corn, soybeans, Coastal bermudagrass, and bahiagrass. The poorly drained and very poorly drained soils in the association are not suited to cultivated crops unless they are drained. They have a fluctuating high water table that rises sharply after heavy rains and remains high for several days.

Slightly more than one-fourth of this association is used for cultivated crops and pasture, and the rest is woodland.

Most farms are of the general type, but some are dairy and beef cattle farms. They are operated by their owners and are about 150 acres in size.

Most soils of this association have severe to moderate limitations for uses related to town and country planning.

6. *Wahee-Coxville association*

Somewhat poorly drained and poorly drained soils that have a loamy surface layer and chiefly clayey underlying layers; on river terraces

This association consists of wet, nearly level terraces along the Altamaha and Ocmulgee Rivers. The soils formed in old alluvium and, in most areas, receive a thin deposit of fresh soil material each time they are flooded. The association makes up about 2 percent of the two counties.

The Wahee soils make up about 55 percent of the association; the Coxville soils, about 40 percent; and minor soils, the rest.

The Wahee soils occupy the higher and better drained positions. They are somewhat poorly drained. Typically, their surface layer is dark grayish-brown silty clay loam about 3 inches thick. The subsoil is silty clay to a depth of 60 inches. It is brown mottled with yellowish brown in the upper part, light brownish gray mottled with yellowish brown in the middle part, and gray mottled with yellowish brown in the lower part.

The Coxville soils are poorly drained. They commonly have a surface layer of black loam about 5 inches thick. The subsoil is silty clay to a depth of 60 inches. It is dark gray in the upper part, gray in the lower part, and mottled with shades of brown throughout.

Minor soils in this association are mainly the poorly drained Pelham and the moderately well drained Johns soils. Also in the association is a small acreage of Cahaba, Johnston, and Rains soils.

Because the soils in this association are clayey in the subsoil and subject to flooding, they are not used for cultivated crops or pasture. The entire acreage is wooded. The dominant trees are hardwoods and pines, but the kinds of trees in a given area are determined largely by the extent of wetness and by management. These soils provide a suitable habitat for wetland wildlife.

This association has severe limitations for uses related to town and country planning because flooding is very frequent and the water table is seasonally high. The association provides good areas, however, for hunting and fishing.

7. *Johnston-Rains association*

Very poorly drained and poorly drained soils that have a loamy surface layer and loamy to sandy underlying layers; mainly along drainageways and in depressions

This association consists mainly of wet, nearly level soils on flood plains along branches and creeks. These soils formed chiefly in recent alluvium and, in many areas, receive a thin deposit of fresh soil material each time they are flooded. The association makes up about 3 percent of the two counties.

The Johnston soils make up about 50 percent of the association; the Rains soils, about 40 percent; and minor soils, the rest.

Johnston soils are very poorly drained and occupy the lowest and wettest parts of the association. They are frequently flooded and remain covered with water for long periods. In the Johnston soils, very dark gray fine sandy loam extends from the surface to a depth of about 40 inches. The underlying layer is gray fine sandy loam that extends to a depth of 60 inches or more.

The Rains soils are poorly drained. Typically, their surface layer is dark-gray loam that is about 4 inches thick and is underlain by about 11 inches of grayish-brown sandy loam. The subsoil, to a depth of about 31 inches, is gray sandy loam that is mottled with shades of brown. Between depths of 31 and 60 inches, the subsoil is gray sandy clay loam that is mottled with strong brown and light olive brown.

Minor soils in the association are chiefly the poorly drained Pelham and the very poorly drained Bayboro soils.

Because the soils in this association are subject to flooding, they are not used for cultivated crops or pasture. The entire acreage is wooded. The dominant trees are hardwoods and a few pines, but the kinds of trees in a given area are determined largely by the extent of wetness and by management.

This association has severe limitations for uses related to town and country planning because of wetness. Under good management, however, it provides suitable habitat for wetland wildlife.

Descriptions of the Soils

This section describes the soil series and mapping units in Appling and Jeff Davis Counties. The approximate acreage and proportionate extent of each mapping unit is given in table 1. Their location is shown on the soil map at the back of this survey.

First each soil series is described in detail, and then, briefly, each mapping unit in that series is described. Thus, to get full information on any one mapping unit, it is necessary to read both the description of that unit and the description of the soil series to which it belongs. The description of the soil series mentions features that apply to all the soils in a series. Differences among the

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soils	Appling County	Jeff Davis County	Total	Extent
	Acres	*Acres*	*Acres*	*Percent*
Albany sand	2, 700	10, 060	12, 760	2. 4
Bayboro loam	4, 695	2, 635	7, 330	1. 4
Cahaba loamy sand	250	1, 730	1, 980	. 4
Carnegie loamy sand, 2 to 5 percent slopes	1, 180	1, 190	2, 370	. 4
Carnegie loamy sand, 5 to 8 percent slopes	2, 430	1, 250	3, 680	. 7
Cowarts loamy sand, 2 to 5 percent slopes	9, 270	9, 515	18, 785	3. 5
Cowarts loamy sand, 5 to 8 percent slopes	5, 760	5, 930	11, 690	2. 2
Coxville loam	0	2, 660	2, 660	. 5
Dunbar loamy sand, 2 to 5 percent slopes	510	800	1, 310	. 2
Dunbar loamy sand, 5 to 12 percent slopes	700	1, 130	1, 830	. 3
Duplin loamy sand, 2 to 5 percent slopes	600	1, 170	1, 770	. 3
Duplin loamy sand, 5 to 8 percent slopes	140	770	910	. 2
Fuquay loamy sand, 0 to 5 percent slopes	15, 605	13, 155	28, 760	5. 3
Hazlehurst loamy sand	3, 660	1, 920	5, 580	1. 0
Irvington loamy sand	8, 380	1, 720	10, 100	1. 9
Johns sandy loam	1, 215	2, 460	3, 675	. 7
Johnston and Rains soils	16, 000	11, 240	27, 240	5. 0
Kershaw sand, 2 to 8 percent slopes	5, 730	2, 150	7, 880	1. 5
Leefield loamy sand	22, 020	18, 630	40, 650	7. 5
Leefield soils	22, 025	18, 630	40, 655	7. 5
Mascotte sand	8, 060	4, 900	12, 960	2. 4
Norfolk loamy sand, 0 to 2 percent slopes	1, 400	1, 470	2, 870	. 5
Norfolk loamy sand, 2 to 5 percent slopes	2, 050	1, 100	3, 150	. 6
Olustee sand	23, 955	11, 610	35, 565	6. 6
Pelham loamy sand	73, 544	27, 830	101, 374	19. 0
Sunsweet sandy loam, 5 to 12 percent slopes, eroded	300	700	1, 000	. 2
Surrency loamy sand	21, 240	4, 980	26, 220	4. 8
Tifton loamy sand, 0 to 2 percent slopes	2, 000	400	2, 400	. 4
Tifton loamy sand, 2 to 5 percent slopes	14, 710	3, 470	18, 180	3. 4
Troup sand, 0 to 5 percent slopes	24, 510	23, 870	48, 380	8. 9
Troup-Wicksburg complex, 8 to 12 percent slopes	6, 350	4, 720	11, 070	2. 0
Wahee and Coxville soils	5, 000	5, 000	10, 000	1. 9
Wicksburg gravelly coarse sand, 2 to 8 percent slopes	22, 075	12, 725	34, 800	6. 4
Total	328, 064	211, 520	539, 584	100. 0

soils of one series are pointed out in the descriptions of the individual soils or are indicated in the soil names.

An important part of the description of each soil series is the soil profile; that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of a profile that is representative for that series. The first is brief and in terms familiar to the layman. The second is much more detailed and is for those who need to make thorough and precise studies of soils. Color terms are for moist soil unless otherwise stated.

Following the name of each mapping unit, there is a symbol in parentheses. This symbol identifies the mapping unit on the soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland suitability group in which the mapping unit has been placed. The "Guide to Mapping Units" at the back of this survey also lists the capability unit and woodland suitability group for each soil in the counties.

Many terms used in the soil descriptions and other sections are defined in the Glossary, and more detailed information about the terminology and methods of soil mapping can be obtained from the "Soil Survey Manual" (*8*)[1].

Descriptions, names, and delineations of soils in this soil survey do not fully agree with soil maps in adjacent counties published at a different date. Differences are the result of better knowledge of soils, modifications in series concepts, intensity of mapping, and the extent of soils within the survey area. In some places it is more feasible to combine small acreages of similar soils that respond to use and management in much the same way than it is to separate these soils and give them names.

[1] Italic numbers in parentheses refer to Literature Cited, p. 62.

Albany Series

The Albany series consists of somewhat poorly dained, sandy soils on low, nearly level ridges. These soils formed in thick beds of unconsolidated sandy and loamy materials. Slopes range from 0 to 3 percent.

In a representative profile, the surface layer is dark-gray sand about 11 inches thick. Beneath this is a layer of pale-yellow loamy sand that extends to a depth of about 44 inches. The upper part of the subsoil is yellow sandy loam that is mottled with light gray and yellowish brown. Below a depth of 50 inches, the subsoil is light-gray sandy clay loam mottled with yellow, red, and yellowish brown.

These soils are low in natural fertility and organic-matter content, and they are very strongly acid to strongly acid. Permeability is rapid in the sandy part of the profile but is moderate in the subsoil. Tilth is good, and the root zone generally is deep. The available water capacity is low in the uppermost 40 inches. A seasonal high water table is 15 to 30 inches below the surface for 1 to 2 months each year.

Wetness sometimes delays planting in spring, but if these soils are adequately drained, they are suited to most locally grown crops, including corn, tobacco, some kinds of truck crops, Coastal bermudagrass, and bahiagrass. Slightly more than one-fourth of the acreage is used for

crops or pasture; the rest is wooded or idle. In the wooded areas, slash and longleaf pines are the chief trees and there are a few oaks.

Representative profile of Albany sand, 1 mile southwest of Denton along U.S. Highway No. 221, in a borrow pit east of road, Jeff Davis County:

A1—0 to 11 inches, dark-gray (10YR 4/1) sand; weak, fine, granular structure; very friable; many fine roots; very strongly acid; clear, wavy boundary.

A21—11 to 34 inches, pale-yellow (2.5Y 8/4) loamy sand; yellow mottles in old root channels; common, fine, faint, white mottles; weak, fine, granular structure; very friable; common fine roots; few, fine, clean sand grains; very strongly acid; gradual, wavy boundary.

A22—34 to 44 inches, pale-yellow (2.5Y 7/4) loamy sand; common, fine, distinct, yellowish-brown (10YR 5/8) mottles and common, medium, distinct, white (5Y 8/2) mottles; weak, medium, granular structure; very friable; common fine roots; few, fine, clean sand grains; very strongly acid; gradual, wavy boundary.

B1t—44 to 50 inches, yellow (2.5Y 7/6) sandy loam; common, medium, distinct, light-gray (10YR 7/1) mottles and common, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; few, fine, clean sand grains; few fine pores; very strongly acid; gradual, wavy boundary.

B2tg—50 to 65 inches, light-gray (5Y 7/2) sandy clay loam and pockets of sandy loam; common, coarse, district, yellow (2.5Y 7/6) mottles and few, coarse, prominent, red (2.5YR 4/6) and yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky and weak, fine, granular structure; friable; sand grains coated and bridged with clay; few, fine, clean sand grains; few small iron concretions; very strongly acid.

The sandy A horizons range from 42 to 45 inches in combined thickness. A thin A12 horizon is present in some places. The A2 horizon ranges from light yellowish brown to pale olive and pale yellow. In some places there are pockets of clean white sand in the A2 horizon. Gray colors having a chroma of 2 or less are in the upper 5 inches of the B horizon. The B2tg horizon ranges from sandy loam to sandy clay loam.

The Albany soils occur with the Leefield, Troup, and Pelham soils. The depth to finer textured material is greater in the Albany soils than it is in the Leefield soils. Albany soils typically are yellower in the A2 horizon and are less well drained than the Troup soils. They are deeper to finer textured material and are less wet than the Pelham soils.

Albany sand (Ad).—This soil is sandy to a depth of 40 inches or more. It generally is in moderately small tracts next to ponds and drainageways in the areas called Flatwoods in Appling and Jeff Davis Counties. Slopes range from 0 to 3 percent. In cultivated areas the surface layer is grayish brown to dark grayish brown and the amount of yellowish and grayish mottles in the underlying layers varies.

Included with this soil in mapping were small areas that have a fine sand surface layer. Also included were small areas of Leefield, Troup, and Pelham soils.

This soil is suited to most crops grown locally, including corn, tobacco, truck crops, bahiagrass, and bermudagrass. Because the seasonal high water table fluctuates, the soil is wet in rainy periods and slightly droughty in dry periods. Planting is often delayed by wetness, and crops are damaged in some years by heavy rains in spring and in summer. A system of tile drains and ditches can remove much of the excess water, and leveling and shaping can eliminate low spots. Surface runoff is slow and creates only a slight hazard of erosion.

Mixing crop residue into the soils helps to maintain good tilth and the content of organic matter. An example of a suitable cropping system is 1 year of corn and 1 year of small grain. Row crops can be grown year after year, but close-growing crops should be used occasionally in the cropping system. Capability unit IIIw-1; woodland suitability group 3w2.

Bayboro Series

The Bayboro series consists of very poorly drained soils in oval depressions where water movement is sluggish. These soils formed in beds of unconsolidated clayey material. Slopes are less than 2 percent.

In a representative profile, the surface layer is mainly black loam about 13 inches thick. The subsoil is gray, mottled clay that extends to a depth of 60 inches or more.

These soils are very strongly acid and are low in natural fertility. They have a fairly high content of organic matter in the surface layer. Permeability is slow, and the available water capacity is high. Tilth generally is poor, and the root zone is deep if the soil is drained.

Bayboro soils occupy more than 1 percent of the survey area. The largest acreage is in the Flatwoods near the watershed divides of the principal creeks. Most of the acreage is woodland, and the chief trees are pines, blackgum, and pond cypress. The suitability of these soils for cultivation is limited by wetness. If adequate drainage and other good management practices are used, these soils are suited to pasture grasses.

Representative profile of Bayboro loam, in a wooded area 2.3 miles west of Altamaha School and 1.8 miles east of county line, 25 yards north of county road, Appling County:

O2—1 inch to 0, dark reddish-brown (5YR 3/2), partially decomposed roots and twigs; many fine roots; extremely acid; smooth boundary.

A11—0 to 10 inches, black (10YR 2/1) loam; moderate, fine and medium, granular structure; friable; many fine roots; very strongly acid; abrupt, smooth boundary.

A12—10 to 13 inches, very dark gray (10YR 3/1) loam; common, medium, faint, light brownish-gray (10YR 6/2) mottles; weak, fine and medium, granular structure; friable; very strongly acid; clear, smooth boundary.

B21tg—13 to 30 inches, gray (N 5/0) clay; common, fine, prominent, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; firm; patchy clay films on peds; few, thin, light-gray (N 7/0) lenses of sand; very strongly acid; gradual, wavy boundary.

B22tg—30 to 60 inches, gray (10YR 5/1) clay; many, medium and coarse, prominent, yellowish-brown (10YR 5/8) mottles and few, fine, prominent, yellowish-red (5YR 4/8) mottles; weak, fine, subangular blocky structure; firm; clay films on peds; very strongly acid.

The O2 horizon is absent from some places. The A11 horizon ranges from 10 to 13 inches in thickness. The A12 horizon is 3 to 4 inches thick and ranges from very dark gray to gray. The B22tg horizon ranges from dark gray to gray. Its texture is dominantly clay but ranges to sandy clay and clay loam. The B22tg horizon is 25 to 40 inches thick. Depth to mottles ranges from 10 to 16 inches.

The Bayboro soils occur with the Pelham and Surrency soils. Bayboro soils are more poorly drained and contain more organic matter than the Pelham soils. They have a finer textured subsoil than the Surrency soils.

529-427—75——2

Bayboro loam (Bf).—This very poorly drained soil typically is in oval depressions that range from 3 to 30 acres in size. Slopes are less than 2 percent.

Included with this soil in mapping were small areas of Surrency and Pelham soils.

This soil is not suited to cultivated crops, because it is flooded more than once each year for periods of 2 to 6 months. The soil can be pastured year after year if it is adequately drained and is well managed. Generally, however, drainage is not feasible.

Most of the acreage is woodland, a good use. The chief trees are pines, blackgum, and pondcypress. Capability unit Vw-1; woodland suitability group 2w9.

Cahaba Series

The Cahaba series consists of well-drained soils on stream terraces, mainly adjacent to the flood plains along the Altamaha and Ocmulgee Rivers. These soils formed in old alluvium. Slopes range from 0 to 3 percent.

In a representative profile, the surface layer is dark-brown loamy sand about 4 inches thick. It is underlain by 4 inches of dark yellowish-brown loamy sand. The subsoil is yellowish-red, dark yellowish-brown, and red sandy clay loam about 34 inches thick. The underlying material is strong-brown coarse sand that extends to a depth of 60 inches or more.

Cahaba soils are low in natural fertility and organic-matter content, and they are strongly acid to very strongly acid throughout. Permeability is moderate, and the available water capacity is medium. The root zone is deep, and tilth is good.

The Cahaba soils are not extensive in Appling and Jeff Davis Counties. Most of the acreage is woodland that consists of mixed pines and a few oaks. These soils are well suited to most crops and pasture grasses grown in the survey area.

Representative profile of Cahaba loamy sand, in a moist, wooded area 1 mile east of concrete bridge on State Highway 135 and 1,200 feet south of the Altamaha River, Jeff Davis County:

Ap—0 to 4 inches, dark-brown (10YR 4/3) loamy sand; weak, fine, granular structure; very friable; many fine and medium roots; strongly acid; clear, smooth boundary.

A2—4 to 8 inches, dark yellowish-brown (10YR 4/4) loamy sand; weak, fine, granular structure; very friable; many fine and medium roots; very strongly acid; gradual, wavy boundary.

Ba—8 to 12 inches, yellowish-red (5YR 4/8) and dark yellowish-brown (10YR 4/4) sandy loam; weak, fine, subangular blocky structure; very friable; few fine and medium roots; very strongly acid; gradual, wavy boundary.

B2t—12 to 36 inches, red (2.5YR 4/8) sandy clay loam; weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots and clean sand grains; very strongly acid; gradual, wavy boundary.

B3t—36 to 42 inches, yellowish-red (5YR 4/8) sandy loam; weak, fine, granular structure to single grained; very friable; few clean sand grains, some grains bridged with clay; few, very small, black concretions; very strongly acid; gradual, wavy boundary.

C—42 to 60 inches, strong-brown (7.5YR 5/8) coarse sand; single grained; loose; sand grains stained; few, small, black concretions; very strongly acid.

The A and B horizons range from 36 to 42 inches in combined thickness. The Ap horizon dominantly is dark-brown to brown loamy sand. In some areas there is an A1 horizon of very dark gray loamy sand. The B2t horizon is yellowish-red or red sandy loam or sandy clay loam. The C horizon typically is sandy; it ranges from coarse sand to loamy sand.

The Cahaba soils occur with Johns and Coxville soils. They are better drained than the Johns soils. They are better drained and contain less clay in the subsoil than the Coxville soils.

Cahaba loamy sand (CX).—This is the only Cahaba soil mapped in the two counties. It is on stream terraces adjacent to the flood plains of the Altamaha and Ocmulgee Rivers, and it is in areas that range from 10 to 50 acres in size. Slopes range from 0 to about 3 percent.

Included with this soil in mapping were small areas of Coxville and Johns soils.

If this soil is well managed, it can be farmed intensively because it has no special limitations that affect management. It is well suited to all crops grown locally, such as corn, tobacco, cotton, soybeans, small grain, millet, Coastal bermudagrass, bahiagrass, crimson clover, and sericea lespedeza.

Erosion is not a hazard on this soil, but crop residue should be used for surface cover when the soil is not protected by plants. The return of crop residue to the soil aids in maintaining good tilth and the organic-matter content of the soil.

Row crops can be grown year after year on this soil without excessive soil loss. However, cropping systems that rotate crops and utilize crop residue generally result in the best response from crops and the least trouble from pests and disease. Capability unit I-1; woodland suitability group 2o7.

Carnegie Series

The Carnegie series consists of well-drained soils on uplands. These soils formed in thick beds of mottled, loamy material. Slopes range from 2 to 8 percent.

In a representative profile, the surface layer is dark grayish-brown loamy sand about 5 inches thick. The subsoil is sandy clay loam that extends to a depth of 60 inches. It is strong brown mottled with shades of red and brown in the upper part and is yellowish brown mottled with shades of red, gray, and yellow in the lower part. Iron concretions are mainly in the upper part of the profile.

These soils are low to moderate in natural fertility and organic-matter content, and they are strongly acid to very strongly acid throughout. Permeability is slow in the lower part of the subsoil, and the available water capacity is medium. Tilth generally is good, and the root zone is moderately deep.

These soils are not extensive but occur in both counties. Slightly more than half the acreage is cultivated or pastured; the rest is woodland consisting chiefly of pine trees, a good use. These soils respond only fairly well to good management if they are used for the crops grown locally.

Representative profile of Carnegie loamy sand, 5 to 8 percent slopes, 3 miles north of Denton, 3 miles east of Snipesville, and 1,200 feet south of State Highway 107, Jeff Davis County:

Apcn—0 to 5 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable;

many fine roots; 25 percent, by volume, iron concretions 5 to 20 millimeters in size; strongly acid; abrupt, smooth boundary.

B21tcn—5 to 22 inches, strong-brown (7.5YR 5/6) sandy clay loam; common, fine, prominent, dusky-red (10R 3/3) mottles; weak, medium, subangular blocky structure; friable; few patchy clay films on some peds and around the pebbles; many fine roots; 15 to 20 percent iron concretions 5 to 20 millimeters in size; 3 percent plinthite; very strongly acid; abrupt, clear boundary.

B22tcn—22 to 26 inches, strong-brown (7.5YR 5/6) sandy clay loam; common, medium, prominent, yellowish-red (5YR 5/6) mottles and few, medium, distinct, light yellowish-brown (2.5Y 6/4) mottles; moderate, medium, subangular blocky structure; friable; few patchy clay films on peds; few fine roots; 5 to 15 percent plinthite; 10 percent iron concretions; very strongly acid; gradual, smooth boundary.

B23t—26 to 30 inches, yellowish-brown (10YR 5/6) sandy clay loam; common, medium, prominent, red (2.5YR 4/6) mottles and few, fine, distinct, pale-yellow (5Y 7/3) mottles; moderate, medium, angular blocky structure to somewhat platy; friable; few patchy clay films on peds; about 5 percent plinthite; very strongly acid; gradual, smooth boundary.

B3t—30 to 60 inches, mottled yellowish-brown (10YR 5/6), dark-red (10YR 3/6), and dusky-red (10YR 3/4) sandy clay loam and light-gray (10YR 7/1) sandy clay; weak, medium, subangular blocky structure; firm; few clay films on peds; few iron concretions and soft to firm plinthite (1 to 5 percent); very strongly acid.

The A horizon ranges from 4 to 7 inches in thickness. Hard iron concretions in the A and the B21t horizons range from 6 to 25 percent in volume and from about 5 to 22 millimeters in size. The Bt horizons range from yellowish brown to strong brown in the matrix. The highest content of plinthite, as much as 15 percent, is in the B22t horizon. In the other Bt horizons, the content of plinthite ranges from 0 to 5 percent. The B21t horizon is chiefly sandy clay loam, but the B22t horizon ranges to clay loam. Light-gray mottles are below a depth of 30 inches in many profiles.

The Carnegie soils occur with the Tifton, Cowarts, and Sunsweet soils. The Carnegie soils are similar to the Tifton soils, but the depth to plinthite in excess of 5 percent is greater than 34 inches in the Tifton soils. The Carnegie soils have 10 to about 15 percent more clay in the B22t horizon and contain more iron concretions in the A horizon than the Cowarts soils. Carnegie soils are less clayey and have a thicker mottle-free zone in the upper part of the B2t horizon than the Sunsweet soils.

Carnegie loamy sand, 2 to 5 percent slopes (CnB).—This soil is on uplands in rather broad areas that range from 10 to 20 acres in size. Included with this soil in mapping were small areas of Tifton and Sunsweet soils. Also included in a few areas were gall spots and a few shallow gullies.

This soil is suited to cultivated crops, pasture plants, and pine trees. Some of the more important crops are corn, cotton, Coastal bermudagrass, and bahiagrass.

Erosion is a hazard in cultivated areas, but the hazard can be reduced by using contour tillage (fig. 2), terraces, vegetated waterways, and stripcropping and by including adequately fertilized, close-growing crops in the cropping system. Both steepness and length of slope affect the cropping system needed to control erosion. An example of a suitable cropping system, where slopes are 3 percent and 200 feet long, is 2 years of corn and 4 years of Coastal bermudagrass.

Slightly more than half the acreage of this soil is cultivated. Capability unit IIe-4; woodland suitability group 2o1.

Carnegie loamy sand, 5 to 8 percent slopes (CnC).—This soil is on uplands in areas that range from 5 to 10 acres in size. Slopes are rather short. A profile of this soil is described as representative of the Carnegie series. Small and medium-sized concretions of iron are on the surface and throughout the profile.

Included with this soil in mapping were small areas of Tifton and Sunsweet soils. Also included in a few places were gall spots and a few shallow gullies.

This soil is suited to cultivated crops, such as corn, cotton, tobacco, oats, and rye, and to hay and pasture crops.

Surface runoff is rapid enough to create a severe hazard of erosion if the soil is cultivated and not protected. Some of the practices that help to control erosion are contour cultivation, terracing, stripcropping, and vegetated waterways. The addition of organic matter helps to control erosion, maintain the content of organic matter, and improve tilth. Results are best if the crop rotation consists mostly of close-growing crops or grass. An example of a suitable cropping system is 3 years of a grass, such as bahiagrass, and 1 year of corn or a similar row crop. This system should be used in fields that are terraced and contour cultivated.

A little more than half of the acreage is cultivated. This soil is better suited to pasture grasses and pine trees than to row crops. Capability unit IVe-4; woodland suitability group 2o1.

Cowarts Series

The Cowarts series consists of well-drained soils on uplands. These soils formed in beds of reticulately mottled sandy clay loam. Slopes range from 2 to 8 percent.

In a representative profile, loamy sand extends from the surface to a depth of about 7 inches. It is dark gray in the upper part and yellowish brown in the lower part. Some small, rounded pebbles of quartz and a few iron concretions are in this layer. The subsoil, to a depth of 60 inches, is sandy clay loam. It is yellowish brown in the upper part and mainly brownish yellow mottled with shades of brown, red, and gray in the lower part. Plinthite is at a depth of about 22 inches.

Cowarts soils are low in natural fertility and organic-matter content, and they are very strongly acid to strongly acid throughout. The available water capacity is medium to low, and permeability is slow. The root zone is moderately deep, and tilth is good.

The natural vegetation is chiefly longleaf pine, blackjack and turkey oaks, and an undergrowth of wiregrass. These soils are suited to most crops commonly grown in Appling and Jeff Davis Counties.

Representative profile of Cowarts loamy sand, 2 to 5 percent slopes, in a wooded area approximately 1 mile west of U.S. Highway No. 1 and Altamaha River bridge, north on graded road to cemetery, about 100 yards south of cemetery, Appling County:

A1—0 to 4 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable; 4 percent small gravel; 2 percent iron concretions; many fine roots; very strongly acid; clear, smooth boundary.

A2—4 to 7 inches, yellowish-brown (10YR 5/4) loamy sand; weak, fine, granular structure; very friable; many fine roots; 4 percent small gravel; few small iron

***Figure 2.*—Contouring on Carnegie loamy sand, 2 to 5 percent slopes.**

concretions; very strongly acid; gradual, wavy boundary.

B21t—7 to 15 inches, yellowish-brown (10YR 5/6) sandy loam; weak, fine, subangular blocky structure; very friable; sand grains coated and bridged with clay; few small concretions 5 to 15 millimeters in size; many fine roots; very strongly acid; gradual, wavy boundary.

B22t—15 to 22 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, fine and medium, subangular blocky structure; firm; sand grains coated and bridged with clay; few small iron concretions; few fine roots; very strongly acid; gradual, wavy boundary.

B23t—22 to 28 inches, yellowish-brown (10YR 5/6) sandy clay loam; common, medium, prominent, red (2.5YR 4/6) mottles; weak, medium, subangular blocky structure; friable; patchy clay films on peds; 10 percent plinthite; few fine roots; very strongly acid; gradual, wavy boundary.

B24t—28 to 42 inches, brownish-yellow (10YR 6/6) sandy clay loam; common, medium, distinct, yellowish-red (5YR 4/8) and red (2.5YR 4/8) mottles; weak, medium, subangular blocky structure; friable; few patchy clay films on peds; 12 percent pinthite; few roots; very strongly acid; gradual, wavy boundary.

B25t—42 to 54 inches, reticulately mottled weak-red (10R 4/4), light-gray (N 7/0), brownish-yellow (10YR 6/6), and yellowish-brown (10YR 5/6) sandy clay loam; moderate, medium, subangular blocky structure; slightly firm; 5 percent plinthite; pockets of sandy clay; patchy clay films on some peds; very strongly acid; gradual, wavy boundary.

B3t—54 to 60 inches, brownish-yellow (10YR 6/8) sandy clay loam; many, coarse, prominent, dark-red (2.5YR 3/6) and light-gray (N 7/0) mottles; weak, fine, subangular blocky structure; friable; pockets of sandy loam; sand grains coated and bridged with clay; few fine mica flakes; very strongly acid.

The A horizons range from 5 to 18 inches in combined thickness. The Ap horizon ranges from dark grayish brown to yellowish brown. A B1 horizon is present in some places and is yellowish-brown sandy clay loam or sandy loam 2 to 3 inches thick. Depth to horizons that contain plinthite ranges from 18 to 24 inches, and the content of plinthite ranges from 5 to 30 percent. Gray mottles begin at a depth of 30 to 42 inches.

The Cowarts soils occur mainly with the Carnegie, Norfolk, Tifton, Wicksburg, and Troup soils. Unlike the Carnegie soils, the Cowarts soils have less than 5 percent iron concretions in the A horizon. Also, they are more friable and contain 10 to about 15 percent less clay in the B22t and B23t horizons than Carnegie soils. Cowarts soils contain more than 5 percent plinthite in the B horizon and are less permeable than Norfolk soils. They resemble the Tifton soils but have a thinner plinthite-free B horizon. Cowarts soils contain plinthite, whereas Wicksburg and Troup soils do not. In addition, Cowarts soils lack the thick sandy A horizons of the Wicksburg and Troup soils.

Cowarts loamy sand, 2 to 5 percent slopes (CqB).—This well-drained soil is mainly on ridgetops in areas ranging from 5 to 15 acres in size. It has the profile described as representative of the Cowarts series.

Included with this soil in mapping were small areas of Wicksburg, Norfolk, Tifton, and Troup soils. Also included were a few gall spots and a few shallow gullies.

This soil is suited to cultivated crops, pasture plants, and pine trees. Some of the more important crops are corn, cotton, Coastal bermudagrass, and bahiagrass.

Erosion is a hazard in cultivated areas, but it can be reduced by using contour tillage, terraces, vegetated waterways, and stripcropping, and by using adequately fertilized, close-growing crops in the cropping system. Both steepness and length of slope affect the cropping system needed to control erosion. An example of a suitable cropping system, where slopes are 3 percent and 200 feet long, is 2 years of corn and 4 years of Coastal bermudagrass.

Slightly more than one-fourth of the acreage is in cultivated crops or pasture. The rest is in slash and longleaf pines, a good use. Capability unit IIe-4; woodland suitability group 2o1.

Cowarts loamy sand, 5 to 8 percent slopes (CqC).—This well-drained soil is on short side slopes near small streams.

Included with this soil in mapping were small areas of Wicksburg, Norfolk, and Tifton soils. In some areas a few gall spots and shallow gullies were also included. In these areas the surface layer is about 5 inches thick or, in some places, has been removed by erosion.

This soil is suited to cultivated crops, such as corn, cotton, tobacco, oats, and rye, and to hay and pasture crops, such as bahiagrass, Coastal bermudagrass, and crimson clover.

Surface runoff is rapid enough to create a severe hazard of erosion if the soil is not protected. Some of the practices that help to control erosion are contour cultivation, terracing, stripcropping, and vegetated waterways. The addition of organic matter also helps to control erosion and to maintain the content of organic matter and good tilth. Results are best if the crop rotation consists mostly of close-growing crops or grass. An example of a suitable cropping system is 3 years of a grass, such as bahiagrass, and 1 year of corn or a similar row crop. This system should be used in fields that are terraced and contour cultivated.

Most of the acreage is woodland, but a small acreage is in cultivated crops and pasture. Capability unit IVe-4; woodland suitability group 2o1.

Coxville Series

The Coxville series consists of poorly drained soils that formed in clayey sediments on terraces along the Altamaha and Ocmulgee Rivers. These soils are flooded periodically. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is black loam about 5 inches thick. The subsoil is silty clay that extends to a depth of 60 inches. It is dark gray in the upper part, gray in the lower part, and mottled with yellowish brown throughout.

These soils are low to moderate in natural fertility and low in organic-matter content. They are very strongly acid throughout. Permeability is moderately slow, and the available water capacity is medium. Tilth is poor, and the depth of the root zone depends on the depth to the water table.

Almost all of the acreage is in pine and hardwood trees, a good use. These soils are not well suited to cultivated crops, because of internal wetness and flooding.

Representative profile of Coxville loam, in a wooded area 4.5 miles north of Oak View Church, 3 miles east-northeast of Philadelphia Methodist Church, Jeff Davis County:

A1—0 to 5 inches, black (10YR 2/1) loam; weak, fine, granular structure; very friable; many fine roots; very strongly acid; clear, wavy boundary.

B21tg—5 to 36 inches, dark-gray (10YR 4/1) silty clay; few, fine, prominent, yellowish-brown mottles; moderate, fine, subangular blocky structure; firm; patchy clay films on some peds; few fine roots; very strongly acid; gradual, wavy boundary.

B22tg—36 to 60 inches, gray (10YR 5/1) silty clay; many, medium, prominent, yellowish-brown (10YR 5/6) mottles; moderate, fine, subangular blocky structure; firm; clay films on some peds; very strongly acid.

The A1 horizon is very dark gray or black. It ranges from 2 to 9 inches in thickness and from loam to silty clay loam in texture. Some profiles have an A2 horizon of light-gray, mottled loam. The B2tg horizons range from dark gray to light gray, and they have yellowish-brown and strong-brown mottles in the upper part and a few red mottles below a depth of 30 inches. Texture of the B2t horizons is mostly silty clay, but it is clay in some places.

The Coxville soils occur with the Cahaba, Wahee, and Johns soils. They are grayer and more poorly drained than the Cahaba and Wahee soils, and they have about 10 to 17 percent more clay in the B2t horizon than Cahaba soils. The Coxville soils are finer textured, are more poorly drained, and have less distinct horizons throughout than the Johns soils.

Coxville loam (Cv).—This poorly drained soil typically is on broad, low terraces along the Altamaha and Ocmulgee Rivers. Its areas range from 10 to 60 acres in size. Slopes range from 0 to 2 percent.

Included with this soil in mapping were small areas of Wahee and Johns soils.

This soil has a seasonally high water table that is at a

depth of less than 15 inches for more than 6 months each year. It is flooded more than once each year for fairly long periods. This soil is not suited to cultivated crops unless drainage practices are used, but it is fairly well suited to pasture grasses such as bahiagrass. Most of the acreage is woodland, a good use. The chief trees are pines, blackgum, sweetgum, and pondcypress. Capability unit Vw-1; woodland suitability group 2w9.

Dunbar Series

The Dunbar series consists of somewhat poorly drained soils on uplands. These soils formed in loamy and clayey materials. Slopes range from 2 to 12 percent.

In a representative profile, the surface layer is dark-gray loamy sand about 6 inches thick. This layer is underlain by about 2 inches of dark-brown sandy loam. The upper part of the subsoil, to a depth of about 11 inches, is yellowish-brown sandy clay that has a few fine mottles of strong brown. The lower part of the subsoil extends to a depth of 48 inches and is mainly light-gray clay mottled with dark red and strong brown. A thin layer of sandstone is at a depth of about 48 inches.

These soils are low in natural fertility and organic-matter content. They are very strongly acid throughout. Permeability is slow, and the available water capacity is medium. Tilth generally is poor, and the root zone mainly is moderately deep.

Dunbar soils are not extensive, and the largest areas are in the northern part of both counties. The soils are not well suited to cultivated crops, because their subsoil is plastic and clayey. Almost all the acreage is in pines and an understory of wiregrass.

Representative profile of Dunbar loamy sand, 5 to 12 percent slopes, 1 mile north-northwest of Harmony Baptist Church and 0.1 mile east of road, Appling County:

A1—0 to 6 inches, dark-gray (10YR 4/1) loamy sand; weak, medium, granular structure; very friable; few small quartz pebbles; many fine roots; very strongly acid; clear, smooth boundary.

A2—6 to 8 inches, dark-brown (10YR 4/3) sandy loam; weak, medium, granular structure; very friable; 1 percent small pebbles; many fine roots; very strongly acid; gradual, smooth boundary.

B21t—8 to 11 inches, yellowish-brown (10YR 5/4) sandy clay; few, fine, faint, strong-brown mottles; moderate, medium, subangular blocky structure; firm; few patchy clay films on peds; common fine roots; very strongly acid; clear, wavy boundary.

B22tg—11 to 44 inches, light-gray (5Y 7/2) clay; common, fine, distinct, strong-brown (7.5YR 5/6) mottles and few, small, prominent, red (10YR 5/6) mottles; strong, medium and fine, subangular and angular blocky structure; very plastic when wet; light-gray coatings on most peds and along root channels; few fine roots; very strongly acid; gradual, wavy boundary.

B3tg—44 to 48 inches, light-gray (5Y 7/2) clay and sandy clay loam; common, medium, distinct, strong-brown (7.5YR 5/6) mottles and few, medium, prominent, dark-red (10YR 3/6) mottles; massive to weak, medium, subangular blocky structure; plastic when wet; few clay films on some peds and along root channels; very strongly acid.

IIR—48 inches, sandstone rock.

The A horizons range from 5 to 12 inches in combined thickness and from very dark gray to dark grayish brown. The B21t horizon ranges from 2 to 3 inches in thickness and from yellowish brown to strong brown. The B22tg horizon is sandy clay to clay and is mottled with red, strong brown, and yellowish brown. The depth to sandstone mainly ranges from 48 to 68 inches. Sandstone, however, is not present in some places.

The Dunbar soils occur with the Duplin, Wicksburg, and Cowarts soils. They are not so well drained as the Duplin soils and are grayer in the B3t horizon. Dunbar soils lack the thick sandy A horizons of the Wicksburg soils and are less well drained than those soils. The Dunbar soils are more clayey in the subsoil than the Cowarts soils and, in contrast to those soils, do not contain plinthite.

Dunbar loamy sand, 2 to 5 percent slopes (DvB).—This somewhat poorly drained soil is in small areas on uplands. Included with it in mapping were small areas of Wicksburg and Duplin soils. Also included were some areas where sandstone crops out or is within 10 inches of the surface.

This soil commonly is not cultivated, because the subsoil is clayey. It is suited to corn, small grain, millet, Coastal bermudagrass, bahiagrass, and white clover. It is poorly suited to tobacco. This soil responds to fertilizer but is slow to warm up in spring. Planting is delayed in years when rainfall is heavy in spring.

Because erosion is the chief hazard, a good use of the soil is for growing perennial grass or trees. The soil can be used for row crops, however, if erosion control measures are applied. Among these are the use of suitable cropping systems, contour cultivation, terraces, grassed waterways, stripcropping, and grass-based rotations. An example of a suitable cropping system is 2 years of Coastal bermudagrass and 1 year of corn that is planted and cultivated so that the bermudagrass is not destroyed.

Most of the acreage is in natural vegetation consisting of scattered pines and a few oaks. Capability unit II-3; woodland suitability group 2w8.

Dunbar loamy sand, 5 to 12 percent slopes (DvD).—This somewhat poorly drained soil is in small areas on uplands, typically at the break of the uplands and the river terraces. A profile of this soil is described as representative of the Dunbar series.

Included with this soil in mapping were small areas of Duplin and Wicksburg soils. Also included were small areas of a similar soil that has about 10 inches of subsoil over sandstone.

This Dunbar soil is not suited to field crops but is suited to pasture. Coastal bermudagrass, bahiagrass, and sericea lespedeza are suited forage plants. Overgrazing should be avoided because erosion is a constant hazard.

Most of the acreage is in natural vegetation consisting of scattered pines and a few oaks. Capability unit VIe-2; woodland suitability group 2w8.

Duplin Series

The Duplin series consists of moderately well drained soils on uplands. These soils formed in beds of reticulately mottled clayey material. Slopes range from 2 to 8 percent.

In a representative profile, the surface layer is dark-gray loamy sand about 5 inches thick. This layer is underlain by 7 inches of brown loamy sand. The subsoil extends to a depth of 60 inches and is mainly strong-brown clay that has gray mottles and a few red mottles.

Duplin soils are low in natural fertility and organic-matter content. They are very strongly acid throughout. Permeability is slow, and the available water capacity is

medium. Tilth is good, and the root zone generally is deep.

These soils are not well suited to most crops grown locally. The soils are not extensive, but they occur throughout the two counties. The natural vegetation is chiefly mixed pines and an understory of wiregrass. Most of the acreage is woodland, a good use.

Representative profile of Duplin loamy sand, 2 to 5 percent slopes, in a wooded area 1.5 miles north-northwest of State Highway 144, 0.8 mile south of Oak Grove Baptist Church, Appling County:

A1—0 to 5 inches, dark-gray (10YR 4/1) loamy sand; weak, fine, granular structure; very friable; many fine roots; very strongly acid; clear, wavy boundary.

A2—5 to 12 inches, brown (10YR 5/3) loamy sand; weak, medium, granular structure; very friable; many fine roots; few medium pores; few small quartz pebbles; very strongly acid; clear, wavy boundary.

B21t—12 to 24 inches, strong-brown (7.5YR 5/6) sandy clay; few, fine, faint, yellowish-red mottles; weak, medium, subangular blocky structure; firm; clay films on some peds; few fine roots; very strongly acid; gradual, wavy boundary.

B22t—24 to 43 inches, strong-brown (7.5YR 5/6) clay; common, coarse, distinct, light-gray (5YR 7/1) mottles and few, fine, distinct, red (2.5YR 4/6) mottles; moderate, medium, subangular blocky structure; very firm; clay films on peds; very strongly acid; gradual, wavy boundary.

B3t—43 to 60 inches, yellowish-brown (10YR 5/6) clay; common, coarse, distinct, light-gray (5Y 7/1) mottles and few, fine, distinct, red (2.5YR 4/6) mottles; moderate, medium, subangular blocky structure to massive; firm; thin clay films on some peds; very strongly acid.

The A1 horizon ranges from dark gray to grayish brown in color and from 3 to 5 inches in thickness. In cultivated areas the Ap horizon is grayish brown to brown. The A2 horizon is 4 to 8 inches thick and ranges from olive yellow to brown. In some places there is a B1 horizon of yellowish-brown sandy loam or sandy clay loam that ranges from 2 to 5 inches in thickness. The B21t horizon is yellowish-brown to strong-brown, firm to very firm sandy clay loam or sandy clay. In the B3t horizon the texture ranges from sandy clay to clay. Gray mottles begin at a depth of 20 to 30 inches, and the amount of gray increases with increasing depth.

The Duplin soils occur with the Dunbar, Cowarts, and Wicksburg soils. Duplin soils are better drained than the Dunbar soils, and their B22t horizon does not have ped surfaces coated with gray as does that horizon in the Dunbar soils. Duplin soils have a finer textured subsoil than Cowarts soils. They lack the thick, sandy surface layer of the Wicksburg soils.

Duplin loamy sand, 2 to 5 percent slopes (DwB).—This moderately well drained soil generally is on rather broad ridges, chiefly in the northwestern part of Jeff Davis County. It occupies areas between 5 and 20 acres in size. A profile of this soil is described as representative of the Duplin series.

Small areas of Dunbar and Wicksburg soils were included with this soil in mapping. Also included were areas of similar soils that have a surface layer and subsoil less than 60 inches in total thickness and have less clay in the lower part of the subsoil than this Duplin soil.

This soil responds only fairly well to good management and is suited to corn, cotton, small grain and millet for grazing, Coastal bermudagrass, and bahiagrass.

Because erosion is the main hazard, a good use of this soil is for growing perennial grass or woodland trees. The soil can be planted to row crops if erosion control measures are applied. An example of a suitable cropping system is 2 years of Coastal bermudagrass and 1 year of corn that is planted and cultivated so that the bermudagrass is not destroyed.

Most of the acreage is woodland. Mixed pines are the chief trees. Capability unit IIe-3; woodland suitability group 2w8.

Duplin loamy sand, 5 to 8 percent slopes (DwC).—This moderately well drained soil is on ridges and short side slopes near drainageways and streams. Included with it in mapping were small areas of Dunbar and Wicksburg soils. Also included were areas of similar soils that have a surface layer and subsoil less than 60 inches in combined thickness and have less clay in the lower part of the subsoil than this Duplin soil.

This soil is suited to most crops grown locally, such as corn, small grain, Coastal bermudagrass, and bahiagrass. Erosion is the principal hazard if the soil is used for cultivated crops.

Cropping systems that help to control soil loss and that build up or maintain the organic-matter content are essential. These cropping systems generally consist of cultivated crops and perennial grasses or legumes in a long-term rotation, or combinations of crop rotations and terraces and vegetated waterways. An example of a suitable cropping system, in a field where slopes are 6 percent, terraces are not used, and cultivation is in straight rows, is 1 year of a row crop, such as corn, and 4 years of bahiagrass.

This is not an important soil in the survey area, and little of it is cultivated. Most of the acreage is woodland, a good use. Capability unit IIIe-3; woodland suitability group 2w8.

Fuquay Series

This series consists of well-drained soils on uplands. These soils formed in thick beds of unconsolidated sandy and loamy materials. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is grayish-brown loamy sand about 8 inches thick. It is underlain by pale-olive and light yellowish-brown loamy sand that extends to a depth of about 22 inches. The subsoil extends to a depth of 63 inches and is mainly yellow and brownish-yellow sandy clay loam. It is mottled in the lower part.

Fuquay soils are low in natural fertility, organic-matter content, and available water capacity. They are very strongly acid throughout. Permeability is mainly moderately rapid in the upper 34 inches but is slow in the lower part of the subsoil. These soils have good tilth and a deep root zone.

Fuquay soils are extensive and are in areas scattered throughout Appling and Jeff Davis Counties. Slightly more than half the acreage is in cultivation or permanent pasture. These soils are suited to most crops and pasture grasses grown in the two counties. Pine trees grow well on these soils.

Representative profile of Fuquay loamy sand, 0 to 5 percent slopes, 3.1 miles west of Altamaha School and 1 mile east of county line, Appling County:

Ap—0 to 8 inches, grayish-brown (10YR 5/2) loamy sand; weak, fine, granular structure; very friable; few small iron concretions; very strongly acid; abrupt, smooth boundary.

A2—8 to 18 inches, pale-olive (5Y 6/3) loamy sand; weak, fine, granular structure; very friable; few small iron concretions; common fine roots; very strongly acid; gradual, wavy boundary.
A3—18 to 22 inches, light yellowish-brown (2.5Y 6/4) loamy sand; weak, fine, granular structure; very friable; few small iron concretions; few fine roots; very strongly acid; gradual, wavy boundary.
B1t—22 to 34 inches, yellow (2.5Y 7/6) sandy loam; weak, fine, subangular blocky structure; very friable; few sand grains coated and bridged with clay; few fine roots; very strongly acid; gradual, wavy boundary.
B21t—34 to 40 inches, yellow (10YR 7/6) sandy clay loam; weak, fine, subangular blocky structure; friable; sand grains coated and bridged with clay; few small iron concretions; few fine roots; very strongly acid; gradual, wavy boundary.
B22t—40 to 54 inches, brownish-yellow (10YR 6/6) sandy clay loam; few, prominent, strong-brown (7.5YR 5/8) mottles; weak, fine, subangular blocky structure; friable; sand grains coated and bridged with clay; few small and medium iron concretions; few fine roots; very strongly acid; gradual, wavy boundary.
B23t—54 to 63 inches, yellow (10YR 7/6) sandy clay loam; common, medium, prominent, strong-brown (7.5YR 5/6) mottles; weak, fine, subangular blocky and weak, fine, granular structure; very friable; sand grains coated and bridged with clay; 6 percent plinthite; very strongly acid.

The A horizons range from 20 to 32 inches in combined thickness. In most places these A horizons contain few to common iron concretions. The Ap, or the A1, horizon ranges from gray to dark grayish brown. The A2 horizon ranges from pale olive to light yellowish brown. The B2t horizons range from yellow to pale yellow and yellowish brown. The B23t horizon is dominantly mottled with strong brown, light gray, yellowish brown, and yellowish red. Horizons that contain more than 5 percent plinthite begin at a depth ranging from 32 to 54 inches.

In Appling and Jeff Davis Counties, a significant acreage of these soils lacks the iron concretions in the A horizon that are typical of the series, but this difference does not alter the usefulness and behavior of the soils.

The Fuquay soils commonly occur with the Leefield, Pelham, and Tifton soils. They are at slightly higher elevations and are better drained than the Leefield and Pelham soils. The Fuquay soils are similar to the Tifton soils but have a thicker A horizon.

Fuquay loamy sand, 0 to 5 percent slopes (FsB).—This well-drained soil typically occurs in large areas, some as much as 50 acres in size, on interstream ridges. Small areas of Norfolk, Leefield, and Tifton soils were included with this soil in mapping. Also included were some areas where slopes are as steep as 7 percent.

Because this soil is slightly droughty, it is limited to some extent in its suitability for crops. It is suited to corn, small grain, and truck crops and to pasture and hay crops. Coastal bermudagrass and bahiagrass are well suited. Crops are likely to be damaged by drought in some years, and heavy fertilization is risky unless supplemental water is available.

Close-growing crops that produce a large amount of residue help to maintain the content of organic matter and the available water capacity. They also aid in controlling erosion (fig. 3). Other practices that help to control erosion are contour cultivation, stripcropping, and vegetated waterways. An example of a suitable cropping system is 1 year of row crops and 1 year of small grain planted in alternate strips on the contour. Crop residue should be shredded and left on the soil surface between crops. Capability unit IIs-1; woodland suitability group 3s2.

Figure 3.—A winter cover crop on Fuquay loamy sand, 0 to 5 percent slopes, provides grazing for cattle.

Hazlehurst Series

The Hazlehurst series consists of somewhat poorly drained soils that are on uplands and have a fragipan or cemented layer in the subsoil. These soils formed in thick beds of mottled, loamy material. Slopes range from 0 to 3 percent.

In a representative profile, the surface layer is dark-gray and light brownish-gray loamy sand about 8 inches thick. It is underlain by about 5 inches of light brownish-gray and dark-gray loamy sand that contains a few iron concretions. The subsoil is sandy clay loam that extends to a depth of 63 inches. It is pale yellow and mottled in the upper part, light gray mottled with shades of brown and yellow in the middle part, and yellowish brown mottled with shades of gray and red in the lower part. At a depth of 24 to 30 inches, there are many, medium to large concretions of iron, and bodies of plinthite that are weakly cemented.

These soils are low in natural fertility and organic-matter content, and they are very strongly acid throughout. Permeability is slow in the fragipan. The available water capacity is medium to low. Tilth generally is good, and the root zone is moderately deep.

Hazlehurst soils are not extensive and are in areas scattered throughout both counties. They are suited to cultivated crops, pasture grasses, and pine trees. These soils respond well to good management. About half the acreage is cultivated or pastured. In wooded areas the natural vegetation consists mostly of pines and a few oaks.

Representative profile of Hazlehurst loamy sand, 3.6 miles north of Pierce-Appling County line and 0.4 mile east of State Highway 15, Appling County:

Ap—0 to 8 inches, dark-gray (10YR 4/1) and light brownish-gray (2.5Y 6/2) loamy sand; weak, fine and medium, granular structure; very friable; many fine roots; very strongly acid; abrupt, smooth boundary.
A2—8 to 13 inches, light brownish-gray (2.5Y 6/2) and dark-gray (10YR 4/1) loamy sand; weak, medium, subangular blocky structure; friable; common fine roots; few small pores; few iron concretions; very strongly acid; gradual, wavy boundary.
B21—13 to 20 inches, pale-yellow (2.5Y 7/4) sandy clay loam; common, medium, prominent, yellowish-brown (10YR 5/8) mottles, few, fine, distinct, yellowish-red (5YR 5/6) mottles, and many, medium, distinct, light-gray

(5Y 7/1) mottles; weak, medium, subangular blocky structure; friable; 1 percent plinthite; iron concretions; very strongly acid; gradual, wavy boundary.

B22—20 to 24 inches, light-gray (10YR 7/1) sandy clay loam; common, medium, distinct, yellow (2.5Y 7/6) and yellowish-brown (10YR 5/6) mottles; weak, medium, subangular blocky structure; friable; 5 percent plinthite; few fine roots; few small iron concretions; very strongly acid; gradual, wavy boundary.

Bx1—24 to 30 inches, light-gray (2.5Y 7/2) sandy clay loam; common, medium, distinct, yellowish-brown (10YR 5/8) mottles; weak, medium, subangular blocky structure; firm and brittle; sand grains coated and bridged with clay; 30 percent large and medium iron concretions; 25 percent plinthite; very strongly acid; gradual, wavy boundary.

Bx2—30 to 50 inches, light-gray (10YR 7/2) sandy clay loam; common, medium, prominent, yellowish-brown (10YR 5/8) and yellow (10YR 7/6) mottles; weak, medium, subangular blocky structure; firm and brittle; few patchy clay films on peds; 10 percent medium-sized iron concretions; 20 percent plinthite; very strongly acid; gradual, wavy boundary.

Bx3—50 to 63 inches, mottled yellowish-brown (10YR 5/8), light-gray (2.5Y 7/2), and yellowish-red (5YR 5/6) sandy clay loam; weak, medium, subangular blocky structure; firm and brittle; about 15 percent plinthite, weakly cemented in places; very strongly acid.

The A horizons range from 10 to 14 inches in combined thickness. The Ap, or the A1, horizon ranges from dark grayish brown to very dark gray. The matrix color of the B21 horizon is pale yellow, brownish yellow, or light yellowish brown. Gray mottles that have chromas of 1 and 2 are within this horizon. The depth to the Bx horizons ranges from 20 to 35 inches. The maximum content of plinthite, estimated to range between 15 and 25 percent, is in these horizons. The highest content of iron concretions, ranging from 6 to 30 percent, begins at a depth of 20 to 26 inches.

The Hazlehurst soils occur with the Tifton, Irvington, and Leefield soils. The Hazlehurst soils are less well drained than Tifton soils and have a fragipan in the subsoil. They are similar to Irvington soils but are not so well drained. Hazlehurst soils lack the thick, sandy A horizons of the Leefield soils and have a brittle fragipan in the subsoil.

Hazlehurst loamy sand (Hi).—This somewhat poorly drained soil has a fragipan. It is on uplands and has slopes ranging from 0 to 3 percent. Small areas of Irvington, Leefield, and Tifton soils were included with this soil in mapping.

Much of this soil is farmed, but some drainage generally is needed in cultivated fields. Because the seasonal water table fluctuates, the soil is wet in rainy periods and slightly droughty in dry periods. The water table is at a depth of 15 to 30 inches for 2 to 6 months each year. Planting is often delayed by wetness, and crops are damaged in some years by heavy rains in spring and summer. A system of ditches can remove much of the excess water, and leveling and shaping can eliminate low spots.

If this soil is adequately drained, it is well suited to corn, cotton, soybeans, small grains, tobacco, and pasture grasses. It is especially well suited to corn and tobacco. Surface runoff is slow and creates only a slight hazard of erosion.

Cropping systems that leave crop residue on or near the surface are helpful in maintaining good tilth and the content of organic matter. An example of a suitable cropping system is corn grown year after year if all crop residue is left on the surface to improve the soil.

About half the acreage of this soil is cultivated, and the rest is woodland. In the wooded areas the main trees are pines, and there are a few oaks. Capability unit IIIw-2; woodland suitability group 2w8.

Irvington Series

The Irvington series consists of moderately well drained soils on uplands. These soils formed in thick beds of mottled, mainly loamy marine sediment. Slopes range from 0 to 3 percent.

In a representative profile, the surface layer is dark grayish-brown loamy sand about 9 inches thick. It contains few to many small iron concretions. The upper part of the subsoil is light olive-brown and light yellowish-brown sandy loam and sandy clay loam about 17 inches thick. The lower part of the subsoil is a cemented fragipan that begins at a depth of about 26 inches and extends to a depth of about 60 inches. It consists of light yellowish-brown and light-gray sandy clay loam that is mottled with strong brown, light gray, yellowish red, and red.

These soils are low in natural fertility and organic-matter content. They are strongly acid to very strongly acid throughout. Permeability is moderately slow, and the available water capacity is medium. Tilth generally is good, and the root zone is moderately deep. These soils have a seasonal high water table that is at a depth of about 15 to 30 inches for 1 to 2 months each year.

Slightly more than half the acreage is cultivated; the rest is in natural vegetation consisting of slash and longleaf pines, a few scrub oaks, and an understory of wiregrass and gallberries. These soils are suited to most crops grown locally. They respond well to heavy fertilization and other good management practices.

Representative profile of Irvington loamy sand, 0.4 mile east of State Highway 15 and 1 mile southwest of Mount Vernon Church, Appling County:

Apcn—0 to 9 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable; many fine roots; 12 percent small iron concretions; strongly acid; abrupt, smooth boundary.

B1cn—9 to 16 inches, light olive-brown (2.5Y 5/4) sandy loam; weak, fine, subangular blocky structure; very friable; sand grains bridged with clay; few fine roots; 10 percent small iron concretions; strongly acid; gradual, wavy boundary.

B2cn—16 to 26 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; few, fine, faint, yellowish-brown mottles; weak, medium, subangular blocky structure; friable; 6 percent small iron concretions; strongly acid; gradual, wavy boundary.

Bx1—26 to 34 inches, light yellowish-brown (2.5Y 6/4) sandy clay loam; few, fine, distinct, light-gray mottles, common, medium, distinct, strong-brown (7.5YR 5/8) mottles, and common, medium, prominent, yellowish-red (5YR 5/6) mottles; moderate, medium, subangular blocky structure; firm and brittle; sand grains coated and bridged with clay; 5 percent small and medium iron concretions; 6 percent plinthite; very strongly acid; gradual, wavy boundary.

Bx2—34 to 40 inches, light-gray (2.5Y 7/2) sandy clay loam; common, medium, prominent, red (2.5YR 4/8) mottles and common, medium, distinct, strong-brown (7.5YR 5/8) mottles; weak, fine, subangular blocky structure to massive; firm; slightly cemented; 10 percent plinthite; many, large, iron-rich pieces of hardpan; very strongly acid; gradual, wavy boundary.

Bx3—40 to 60 inches, iron-rich hardpan coated with small amount of sandy clay loam soil material; structureless; firm to very firm.

The A horizon ranges from 7 to 13 inches in thickness. The Ap, or A1, horizon ranges from dark gray to grayish brown. The B2cn horizon ranges from yellowish brown to light olive brown. Depth to the Bx1 horizon, or fragipan layer, ranges from 25 to 35 inches. Content of iron concretions ranges from 20 percent in the upper part of profile to none in the lower part.

The Irvington soils occur with the Tifton, Hazlehurst, and Leefield soils. They have a fragipan that is lacking in the Tifton and Leefield soils. They are less well drained than the Tifton soils but are better drained than the Leefield soils. Irvington soils are similar to Hazlehurst soils but are better drained.

Irvington loamy sand (Ij).—This moderately well drained soil has a fragipan and typically is on broad uplands. It is in areas that range from 5 to 50 acres in size. Slopes are 0 to 3 percent.

Included with this soil in mapping were small areas of Hazlehurst, Tifton, and Leefield soils.

This soil is suited to crops grown locally, such as tobacco, corn, cotton, soybeans, small grain, millet, Coastal bermudagrass, bahiagrass, and white clover. In some years, however, wetness delays planting and can cause crop damage unless drainage measures, such as tiling, ditching, or landforming, are applied. Response of high-value crops, such as tobacco, can be insured by supplemental irrigation in dry periods. Wells, ponds, or streams ordinarily are sources of water for this purpose.

Erosion is not a hazard, and cultivated crops can be grown year after year without damage to the soil. Rotation of crops, however, helps to control disease and to use fertilizer efficiently. Plant residue and aftermath should be shredded and mixed with the soil during seedbed preparation to maintain the organic-matter content and good tilth. An example of a suitable cropping system for this soil is 1 year of tobacco and 2 years of bahiagrass. Capability unit IIw-2; woodland suitability group 2o7.

Johns Series

The Johns series consists of moderately well drained to somewhat poorly drained soils on terraces along the Altamaha and Ocmulgee Rivers. These soils formed in thick beds of loamy materials. Slopes range from 0 to 2 percent.

In a representative profile, the surface layer is brown sandy loam about 10 inches thick. It is underlain by a layer of yellowish-brown sandy loam about 3 inches thick. The upper part of the subsoil is 11 inches of sandy clay loam and 14 inches of clay. This part is yellowish brown and is mottled with shades of red, brown, and gray below a depth of about 18 inches. The lower part of the subsoil, between depths of 38 and 63 inches, is light-gray sandy clay loam and sandy loam mottled with red and yellowish brown.

These soils are low or moderate in natural fertility, low in organic-matter content, and strongly acid or very strongly acid throughout. Permeability is moderate, and the available water capacity is medium. Tilth is good, and the root zone mainly is moderately deep.

The Johns soils are not extensive in the two counties. Almost all of the acreage is woodland that consists of mixed pines and a few hardwoods. These soils are suited to most cultivated crops grown locally.

Representative profile of Johns sandy loam, 350 feet west of Southern Railroad track and 0.3 mile south of the Altamaha River, Jeff Davis County:

A1—0 to 10 inches, brown (10YR 4/3) sandy loam; moderate, medium, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

A2—10 to 13 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, smooth boundary.

B21t—13 to 18 inches, yellowish-brown (10YR 5/8) sandy clay loam; few, fine, prominent, red (2.5YR 4/6) mottles; weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; few root channels filled with soil material from A2 horizon; strongly acid; clear, smooth boundary.

B22t—18 to 24 inches, yellowish-brown (10YR 5/8) sandy clay loam; common, fine, distinct, red (2.5YR 4/6), light-gray (5Y 7/1), and strong-brown (7.5YR 5/8) mottles; moderate, medium, subangular blocky structure; firm; sand grains coated and bridged with clay; few, soft, black manganese nodules; few fine roots; very strongly acid; gradual, smooth boundary.

B23t—24 to 38 inches, yellowish-brown (10YR 5/8) clay; many, fine, prominent, red (2.5YR 4/6) mottles and common, medium, distinct, light-gray (5Y 7/1) mottles; moderate, medium, subangular blocky structure; firm; few fine roots; clay films on peds; few fine mica flakes; very strongly acid; gradual, smooth boundary.

B24tg—38 to 50 inches, light-gray (10YR 7/1) sandy clay loam; many, medium, distinct, red (2.5YR 4/6) and yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; friable; few clay films on some peds; few fine mica flakes; very strongly acid; clear, smooth boundary.

B3tg—50 to 63 inches, light-gray (N 7/0) sandy loam; common, medium, distinct, red (2.5YR 4/6) and yellowish-brown (10YR 5/6) mottles; weak, fine, subangular blocky structure; friable; sand grains coated and some bridged with clay; very strongly acid.

The A1 horizon ranges from 5 to 10 inches in thickness and from grayish brown to brown. The B22t horizon ranges from yellowish brown to strong brown in the matrix. The B3tg horizon is mostly gray and is sandy loam or loamy sand. The depth to gray mottles ranges from 18 to 26 inches.

In Appling and Jeff Davis Counties, the Johns soils are slightly outside the range defined for the series, mainly because their solum is thicker. This difference does not alter their usefulness and behavior.

The Johns soils occur with the Coxville, Cahaba, and Wahee soils. They are less wet and less gray in the subsoil than the Coxville and Wahee soils. They are not so well drained as the Cahaba soils and have a browner and less friable subsoil than those soils.

Johns sandy loam (Jc).—This moderately well drained to somewhat poorly drained soil is on terraces along the Altamaha and Ocmulgee Rivers. It is in small, narrow bands that range from 5 to 15 acres in size. Slopes are 0 to 2 percent. This soil is flooded occasionally for short periods.

Included in mapping were a few small areas of a soil that is similar to this Johns soil but has a surface layer of silty clay loam or fine sandy loam. Also included was a small acreage of soils that have a subsoil of red or dark-brown silty clay.

This soil is suited to crops grown locally, including corn, soybeans, small grain, millet, Coastal bermudagrass, bahiagrass, and white clover. In some years, however, wetness delays planting and can cause crop damage unless drainage measures, such as tiling, ditching, or landforming, are applied.

Erosion is not a hazard, and if management is good, cultivated crops can be grown year after year without

damage to the soil. Rotation of crops, however, helps to control disease and to use fertilizer efficiently. Plant residue and aftermath should be shredded and mixed with the soil during seedbed preparation to maintain the organic-matter content and good tilth. An example of a suitable cropping system is 1 year of corn and 2 years of bahiagrass.

Almost all the acreage of this soil is in pine trees, a good use. Capability unit IIw-2; woodland suitability group 2w2.

Johnston Series

The Johnston series consists of very poorly drained soils in drainageways and in depressions subject to stream overflow. These soils are covered by standing water for long periods of time. Slopes are 0 to 1 percent.

In a representative profile, the soil is very dark gray fine sandy loam to a depth of about 40 inches. The underlying layer is gray fine sandy loam that extends to a depth of 60 inches or more.

These soils are very strongly acid throughout. They contain a large amount of organic matter in the upper 30 inches and are moderate in natural fertility. Permeability is moderately rapid to rapid, and the available water capacity is medium. Tilth is poor, and the depth of the root zone depends on the depth to the water table. The seasonal high water table is less than 15 inches below the surface for 6 to 12 months each year. These soils are flooded each year for periods longer than 6 months.

Johnston soils are extensive in the two counties. All of the acreage is woodland that consists mainly of hardwoods. In addition, there are a few pines. The suitability of Johnston soils for most uses is limited by wetness.

In these two counties, Johnston soils are mapped only in an undifferentiated group with Rains soils.

Representative profile of Johnston fine sandy loam in an area of Johnston and Rains soils, in a wooded area, 2.8 miles south of Baxley city limits on U.S. Highway No. 1 and 500 feet west along Sweetwater Creek, Appling County:

A1—0 to 40 inches, very dark gray (10YR 3/1) fine sandy loam; high in organic-matter content; structureless; many fine and medium roots; very strongly acid; gradual, smooth boundary.

IICg—40 to 60 inches, gray (10YR 6/1) fine sandy loam; structureless; lenses and pockets of loamy sand and sand; very strongly acid.

The A1 horizon ranges from 23 to 40 inches in thickness and from very dark gray to black in color. The IICg horizon is mostly fine sandy loam, but in some places it ranges to clay below a depth of 40 inches.

The Johnston soils occur with the Rains soils. They are more poorly drained and contain less clay and more organic matter than the Rains soils.

Johnston and Rains soils (Jd).—These soils are along small drainageways. They occur in irregular patterns, but in many mapped areas the very poorly drained Johnston soil makes up about 50 percent of the acreage, the poorly drained Rains soil about 40 percent, and other wet soils about 10 percent. Slopes are 0 to 1 percent.

The Johnston and Rains soils in this mapping unit have the profiles described as representative for their series. In places, however, the Rains soil has been covered with light-gray sandy overwash 4 inches or less thick.

The soils of this unit must be extensively drained before they can be used successfully for crops and pasture. Drainage generally is not feasible for cultivated crops, because the soils are flooded for long periods in winter, in spring, and early in summer. Bahiagrass can be grown after excess water has been removed, but woodland is generally a better use.

Most of the acreage is wooded. The natural vegetation is hardwoods and a few pines. Capability unit Vw-2; Johnston part in woodland suitability group 1w9, Rains part in woodland suitability group 2w3.

Kershaw Series

The Kershaw series consists of excessively drained, sandy soils on uplands. These soils are mostly on sandy ridges along the eastern side of small rivers and large creeks. They formed in beds of unconsolidated sands 8 to 20 feet thick. Slopes range mostly from 2 to 8 percent.

In a representative profile, the surface layer is very dark gray sand about 2 inches thick. Below this, to a depth of about 36 inches, is yellowish-brown sand. Between depths of 36 and about 72 inches is pale-brown sand.

Kershaw soils are low in natural fertility and organic-matter content. They are very strongly acid throughout. The available water capacity is very low, and permeability is very rapid. The root zone is deep, and tilth is good.

These soils are not extensive but occur in both counties. The natural vegetation is chiefly blackjack and turkey oaks, and there are a few scattered longleaf pines. The soils are not suited to cultivated crops, because the sand is so thick and so droughty. Almost all the acreage is woodland (fig. 4).

Representative profile of Kershaw sand, 2 to 8 percent slopes, in a wooded area one-eighth mile southeast of Oak Grove Church, along Tenmile Creek, Appling County:

A1—0 to 2 inches, very dark gray (10YR 3/1) sand; single grained; loose; many fine and medium roots; most sand grains coated with organic matter; very strongly acid; abrupt, smooth boundary.

C1—2 to 36 inches, yellowish-brown (10YR 5/4) sand; single grained; loose; few medium roots; sand grains stained; very strongly acid; gradual, wavy boundary.

C2—36 to 72 inches, pale-brown (10YR 6/3) sand; single grained; loose; few medium roots; very strongly acid.

The A horizon ranges from 2 to 6 inches in thickness and is mostly very dark gray to dark gray. The C1 horizon is mainly yellowish brown but ranges to brownish yellow. The C2 horizon is generally pale brown but is yellow in some places. Depth to fine-textured material ranges from 8 to 20 feet.

Kershaw soils occur mostly with Troup and Cowarts soils. They are sandy to a greater depth than Troup soils and lack the loamy subsoil of those soils. Kershaw soils are much more sandy and more droughty than Cowarts soils.

Kershaw sand, 2 to 8 percent slopes (KdC).—This droughty, sandy soil is on broad upland ridges that resemble old dunes. The areas range from about 10 to 50 acres in size.

Figure 4.—**The natural vegetation on Kershaw sand, 2 to 8 percent slopes, indicates that this soil is droughty.**

Included in mapping were some areas of a soil that is similar to this Kershaw soil, except that the surface layer and the upper part of the underlying layers are white. Also included were small areas where the slope is 9 to 12 percent.

Most of the acreage is in trees. Because the soil is droughty, vegetation is sparse and consists chiefly of blackjack and turkey oaks and a few scattered longleaf pines. This soil is not suitable for cultivation and is only poorly suited to grasses. Coastal bermudagrass and bahiagrass can be grown, but their response is poor even if management is good. Capability unit VIIs-1; woodland suitability group 5s3.

Leefield Series

The Leefield series consists of somewhat poorly drained, friable soils on uplands. These soils formed in thick beds of unconsolidated loamy materials. Slopes range from 0 to 3 percent.

In a representative profile, the soil is loamy sand to a depth of about 26 inches. This material is dark gray in the upper part and grayish brown in the lower part. The subsoil is sandy loam and sandy clay loam that extends to a depth of 63 inches. It is mostly pale yellow in the upper part, light gray mottled with shades of yellow and brown in the middle part, and yellowish

brown mottled with shades of gray, yellow, and red in the lower part.

These soils are low in natural fertility and organic-matter content, and they are very strongly acid throughout. Permeability is moderately slow in the lower part of the subsoil. The available water capacity is mainly low. The root zone is deep, and tilth is good.

The Leefield soils are in areas scattered throughout Appling and Jeff Davis Counties. Slightly more than half the acreage is woodland consisting of mixed pines and a few oaks. The rest is cultivated or pastured. These soils are suited to most crops and pasture grasses grown in the two counties.

Representative profile of Leefield loamy sand, in a cultivated area, 2 miles west-southwest of Hazlehurst on county road, three-fourths mile north of State Highway 268 and one-fourth mile south of farmhouse, Jeff Davis County:

Ap—0 to 12 inches, dark-gray (10YR 4/1) loamy sand; few, fine, faint, gray and olive mottles and common, fine, distinct, brownish-yellow (10YR 6/6) mottles; weak, fine and medium, granular structure; very friable; few fine roots; very strongly acid; abrupt, smooth boundary.

A2—12 to 26 inches, grayish-brown (2.5Y 5/2) loamy sand; few, fine, faint, gray and pale-olive mottles and common, fine, distinct, brownish-yellow (10YR 6/6) mottles; weak, fine and medium, granular structure; very friable; few fine roots; few small concretions; very strongly acid; gradual, wavy boundary.

B1t—26 to 30 inches, pale-yellow (2.5Y 7/4) sandy loam; common, medium, distinct, brownish-yellow (10YR 6/6) mottles; weak, fine, subangular blocky structure; friable; few small concretions; spots of clean sand grains; some sand grains coated and bridged with clay; very strongly acid; gradual, wavy boundary.

B22t—30 to 42 inches, light-gray (2.5Y 7/2) sandy clay loam; many, medium, faint, pale-yellow (2.5Y 7/4) mottles and common, medium, distinct, strong-brown (7.5YR 5/8) mottles; weak, medium, subangular blocky structure; friable; sand grains coated and bridged with clay; few fine roots; 4 percent of strong-brown peds are brittle, and some have red centers; very strongly acid; gradual, wavy boundary.

B23t—42 to 63 inches, mottled yellowish-brown (10YR 5/6), pale-yellow (2.5Y 7/4), olive-yellow (2.5Y 6/8), light-gray (2.5Y 7/2), and red (2.5YR 4/8) sandy clay loam; weak, medium, subangular blocky structure; friable; patchy clay films on peds; 10 percent plinthite; few, small and medium, dark-brown iron concretions; very strongly acid.

The A horizons range from 20 to 36 inches in combined thickness. The Ap, or the A1, horizon ranges from dark gray to gray. The A2 horizon is chiefly grayish brown to light brownish gray and, in some places, contains gray and pale-olive mottles. The B1 horizon is mostly pale-yellow, light yellowish-brown, or pale-brown sandy loam that contains brownish-yellow mottles. It ranges from 5 to 16 inches in thickness. The B2t horizons are mostly pale yellow to light gray that is mottled with pale yellow, yellowish brown, and strong brown. In some places, however, there is no dominant color. The B2t horizons range from sandy clay loam to sandy loam. The layer that conains plinthite begins at a depth ranging from 28 to 48 inches, and the content of plinthite ranges from 5 to 15 percent.

The Leefield soils occur mostly with the Olustee, Hazlehurst, and Pelham soils. Leefield soils are sandy to a greater depth than the Hazlehurst soils and lack the fragipan of those soils. They lack the organically stained layer of the Olustee soils. Leefield soils occupy higher parts of the landscape and are better drained than the Pelham soils.

Leefield loamy sand (Ls).—This somewhat poorly drained soil typically is on flats adjacent to ponded areas and drainageways. Mapped areas range from 10 to 30 acres in size. Slopes range from 0 to 3 percent. A profile of this soil is described as representative of the Leefield series.

Included with this soil in mapping were small areas of Olustee, Hazlehurst, and Pelham soils. Also included in some places were areas of similar soils that are sandy to a depth of less than 20 inches.

This soil is wet in rainy periods but is slighty droughty in dry periods. Unless the soil is drained, the seasonal high water table is at a depth of about 15 to 30 inches for 2 to 6 months each year.

Some drainage generally is needed if this soil is to be cultivated. If adequately drained, it is well suited to corn, tobacco, soybeans, small grains, pasture grasses, and other crops grown locally. It is especially well suited to corn and tobacco (fig. 5). Response of high-value crops, such as tobacco, can be insured by irrigation in dry periods. Wells, ponds, or streams ordinarily are sources of water for this purpose.

Erosion is not a hazard, and crops can be grown year after year without damage to the soil. Rotation of crops, however, helps to control disease and to use fertilizer efficiently. Plant residue should be shredded and mixed with the soil during seedbed preparation to maintain the organic-matter content. An example of a suitable cropping system is 1 year of tobacco and 2 years of bahiagrass.

The largest acreage of this soil is pine woodland. Capability unit IIw-2; woodland suitability group 3w2.

Leefield soils (Ll).—These somewhat poorly drained soils are on low flats adjacent to ponded areas and drainageways. Areas of these soils range from 10 to 30 acres in size. Slopes range from 0 to 2 percent.

About 60 percent of the acreage consists of Leefield soils, and about 40 percent consists of soils that are similar to Leefield soils but are slightly wetter.

Because the seasonal water table fluctuates, these soils are wet in rainy periods and slightly droughty in dry periods. The seasonal water table is at a depth of about 15 to 30 inches for 2 to 6 months each year.

Some drainage generally is needed if these soils are to be cultivated. If adequately drained, they are suited to tobacco, corn, soybeans, small grains, pasture grasses, and other crops grown locally. Response of high-value crops, such as tobacco, can be insured by irrigation in dry periods. Wells, ponds, or nearby streams ordinarily are sources of water for this purpose.

These soils can be farmed year after year without damage. Rotation of crops, however, helps to control disease and to use fertilizer efficiently. Plant residue should be shredded and mixed with the soil during seedbed preparation to maintain the organic-matter content. An example of a suitable cropping system is 1 year of tobacco and 2 years of bahiagrass.

The largest acreage of these soils is pine woodland. Capability unit IIw-2; woodland suitability group 3w2.

Mascotte Series

The Mascotte series consists of poorly drained, nearly level soils that formed in sandy and loamy materials on low uplands. These soils have a layer cemented with organic matter in their subsoil.

Figure 5.—**Tobacco on Leefield loamy sand.**

In a representative profile, the surface layer is black and white sand about 3 inches thick. It is underlain by 9 inches of gray sand. The next layer is sand, about 5 inches thick, that is weakly cemented with organic matter. It is black and dark brown in the upper part and mainly very dark brown in the lower part. The next layer is mainly pale-brown and pale-yellow sand that extends to a depth of about 38 inches. The lower part of the profile, to a depth of about 63 inches, is light-gray sandy loam mottled with strong brown, yellowish brown, and pale yellow.

Mascotte soils are low in natural fertility, in organic-matter content, and in available water capacity. They are very strongly acid throughout. Permeability is moderate. These soils are saturated during winter and spring by a seasonal high water table that is within 15 inches of the surface for 1 to 2 months each year. They have a shallow root zone because of the organically cemented layer and wetness. Tilth is only fair.

Most of the acreage is in pine trees and an understory of dwarf chlorous palmetto, runner oak, and other dwarf vegetation. These soils are not generally suitable for cultivation, mainly because they are wet. Some areas have been cultivated, but generally the results have been poor. Pine trees ordinarily are of poor quality; they have flattened tops after about 25 years of age.

Representative profile of Mascotte sand, in a wooded site 3 miles west of Surrency, 1 mile south of U.S. Highway No. 341, Appling County:

A1—0 to 3 inches, black (10YR 2/1) and white (10YR 8/1) sand; single grained; loose; many fine and medium roots; 2 to 3 percent organic matter; very strongly acid; abrupt, smooth boundary.

A2—3 to 12 inches, gray (10YR 6/1) sand; single grained; loose; few fine and medium roots; sand grains uncoated; few small specks of organic matter; very strongly acid; clear, smooth boundary.

B21h—12 to 15 inches, black (10YR 2/1) and dark-brown (7.5YR 3/2) sand; weak, fine, granular structure; firm when moist, hard when dry; weakly cemented

with organic matter; many fine roots in upper part of layer; some sand grains are clean, but most are coated with organic matter; very strongly acid; clear, irregular boundary.

B22h—15 to 17 inches, very dark brown (10YR 2/2) and dark grayish-brown (10YR 4/2) sand; weak, fine, granular structure; friable when moist, slightly hard when dry; weakly cemented with organic matter; very strongly acid; gradual, wavy boundary.

A'21—17 to 26 inches, pale-brown (10YR 6/3) sand; a few tongues of dark grayish-brown (10YR 4/2) material from Bh horizon; single grained and weak, fine, granular srtucture; very friable; most sand grains coated with silt and clay; very strongly acid; gradual, wavy boundary.

A'22—26 to 38 inches, pale-yellow (2.5Y 7/4) sand; common, medium, distinct, white (5Y 8/2) mottles; single grained to weak, fine, granular structure; very friable; most sand grains partly coated; very strongly acid; gradual, wavy boundary.

B'tg—38 to 63 inches, light-gray (2.5Y 7/2) sandy loam and streaks of sandy clay loam; common, medium, prominent, yellowish-brown (10YR 5/8) and strong-brown (7.5YR 5/8) mottles and common, medium, faint, pale-yellow (2.5Y 7/4) mottles; weak, fine, subangular blocky structure; friable; most sand grains coated and bridged with clay; few small concretions; very strongly acid.

The A1 horizon ranges from 3 to 6 inches in thickness. The A2 horizon has gray mottles in the lower part in some places. Depth to the B21h horizon ranges from 12 to 24 inches, and depth to the B'tg horizon ranges from 35 to 40 inches. In some places the B'tg horizon is sandy clay loam.

The Mascotte soils commonly occur with Pelham, Surrency, and Olustee soils. They have an organically cemented layer that is lacking in the Pelham and the Surrency soils. The Mascotte soils have a leached A2 horizon, but the Olustee soils do not.

Mascotte sand (Mn).—This poorly drained soil typically is on low, slightly convex ridges in the areas called Flatwoods. Areas of Mascotte sand range from about 5 to 50 acres in size. Slopes range from 0 to 2 percent.

Areas mapped as this soil include small areas of Olustee and Pelham soils in some places.

This soil is wet in rainy periods and droughty in dry periods because the water table fluctuates. The soil responds poorly to good management, and generally it is not used for cultivated crops. Pasture grasses, such as bahiagrass, are suited if excess surface water is removed.

Most of the acreage is in stunted pine trees and an understory of dwarf palmetto and runner oak. Capability unit Vw-4; woodland suitability group 3w2.

Norfolk Series

The Norfolk series consists of well-drained, friable soils on uplands. These soils have a sandy surface layer and a loamy subsoil. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is dark grayish-brown loamy sand about 10 inches thick. It is underlain by 2 inches of light olive-brown loamy sand. The upper 10 inches of the subsoil is yellowish-brown sandy loam. The lower part of the subsoil is brownish-yellow sandy clay loam that extends to a depth of more than 60 inches.

These soils are low to moderate in natural fertility, low in organic-matter content, and strongly acid throughout. Permeability is moderate. The available water capacity is medium. Tilth generally is good, and the root zone is deep.

The Norfolk soils are not extensive but are in both counties. The natural vegetation consists of longleaf and slash pines, a few scattered scrub oaks, and an undergrowth of wiregrass. A little more than half the acreage is cultivated or in permanent pasture. These soils are well suited to many kinds of crops and are important to farming in the two counties.

Representative profile of Norfolk loamy sand, 0 to 2 percent slopes, 0.5 mile northwest of Mt. Zion Church, 1.25 miles southeast of Rocky Branch Church, 50 feet south of county road, Jeff Davis County:

Ap—0 to 10 inches, dark grayish-brown (2.5Y 4/2) loamy sand; weak, fine, granular structure; very friable; many fine roots; strongly acid; abrupt, smooth boundary.

A2—10 to 12 inches, light olive-brown (2.5Y 5/4) loamy sand; weak, fine, granular structure; very friable; many fine roots; strongly acid; clear, wavy boundary.

B1—12 to 22 inches, yellowish-brown (10YR 5/4) sandy loam; weak, fine and medium, granular structure; very friable; few fine roots; strongly acid; gradual, wavy boundary.

B21t—22 to 30 inches, brownish-yellow (10YR 6/6) sandy clay loam; weak, fine, subangular blocky structure; friable; sand grains coated and bridged with clay; strongly acid; gradual, wavy boundary.

B22t—30 to 50 inches, brownish-yellow (10YR 6/6) sandy clay loam; weak, medium, subangular blocky structure; friable; patchy clay films on peds; few iron concretions; strongly acid; gradual, wavy boundary.

B23t—50 to 63 inches, brownish-yellow (10YR 6/6) sandy clay loam; few, medium, faint, strong-brown (7.5YR 5/6) mottles; weak, fine, subangular blocky structure; friable; patchy clay films on peds; 3 percent plinthite; few iron concretions; strongly acid.

The A horizons range from 8 to 17 inches in combined thickness. The Ap, or the A1, horizon ranges from grayish brown to dark grayish brown. The B2t horizons have gray mottles at a depth of 46 to 52 inches in some places. In most places the Bt horizons are sandy clay loam, but in a few places the B23t horizon ranges to sandy loam below a depth of 60 inches. Few to common, medium mottles of strong brown and yellowish red are at a depth of about 50 inches in most places.

Norfolk soils occur mainly with Tifton, Fuquay, and Leefield soils. They have a yellower subsoil than the Tifton soils, and they do not contain so many iron concretions or so much plinthite as those soils. Norfolk soils have thinner A horizons and contain less plinthite than the Fuquay and Leefield soils. They are better drained than the Leefield soils.

Norfolk loamy sand, 0 to 2 percent slopes (NhA).—This well-drained soil is on interstream ridges of the uplands. It is in areas that range from about 10 to 30 acres in size. A profile of this soil is described as representative of the Norfolk series.

Included with this soil in mapping were small areas of Tifton, Fuquay, and Leefield soils.

This soil is well suited to all crops grown locally, including corn, tobacco, cotton, soybeans, small grain, millet, Coastal bermudagrass, bahiagrass, crimson clover, and sericea lespedeza. It has no special limitations that affect management, but crop residue should be used for covering the surface when the soil is not protected by plants. The return of crop residue to the soil aids in maintaining good tilth and the organic-matter content.

Row crops can be grown year after year without excessive soil loss. However, cropping systems that rotate crops and utilize crop residue generally result in the

best response from crops and the least trouble from pests and disease.

More than half the acreage of this soil is used for cultivated crops or pasture, and the rest is woodland. Capability unit I–1; woodland suitability group 2o1.

Norfolk loamy sand, 2 to 5 percent slopes (NhB).—This well-drained soil is on uplands. Its profile is similar to the one described as representative for the series, but the surface layer is about 4 inches thinner.

Included with this soil in mapping were small areas of Tifton, Fuquay, and Leefield soils.

This soil is well suited to all crops grown locally, including corn, tobacco, cotton, soybeans, small grain, millet, Coastal bermudagrass, bahiagrass, crimson clover, and sericea lespedeza. It responds well to good management.

If row crops or other cultivated plants are grown on this soil, surface runoff may be rapid enough to cause erosion. Erosion can be controlled by using such practices as terracing, contour farming, and waterways that are supported by a suitable system for managing crops. An example of a suitable cropping system on a terraced field, where slopes are about 3 percent, is 1 year of corn and 1 year of soybeans. Both crops should be highly fertilized, and the crop residue should be shredded after harvest and left on the surface through winter.

About two-thirds of the acreage is in cultivated crops or permanent pasture; the rest is woodland. Capability unit IIe-1; woodland suitability group 2o1.

Olustee Series

The Olustee series consists of poorly drained soils that are mostly on broad, level, wet plains. These soils formed in beds of sandy and loamy materials. Slopes are less than 2 percent.

In a representative profile, the surface layer is very dark gray sand about 6 inches thick. Next is a layer of dark-brown sand, about 4 inches thick, that is weakly cemented and stained with organic matter. Beneath this, to a depth of about 28 inches, is light yellowish-brown loamy sand that is mottled with white. Between depths of 28 and 60 inches, the soil is brownish-yellow sandy loam that is mottled with reddish yellow, white, and strong brown.

These soils are low to moderate in organic-matter content and are low in natural fertility and available water capacity. They are strongly acid throughout. Permeability is moderate. Tilth generally is good. The depth of the root zone depends largely on the depth to the water table during the growing season.

Olustee soils are extensive in both counties. Slightly more than three-fourths of the acreage is woodland, and the rest is in row crops and pasture grasses. The natural vegetation is slash and longleaf pines and an undergrowth of wiregrass, gallberry, and palmetto.

Representative profile of Olustee sand, in a cultivated area, 0.8 mile south of Graham and 3 miles west-northwest of Pine Grove, Appling County:

A1—0 to 6 inches, very dark gray (10YR 3/1) sand; weak, fine, granular structure; loose; many roots; strongly acid; abrupt, wavy boundary.

Bh—6 to 10 inches, dark-brown (7.5YR 3/2) sand; weak, medium, subangular blocky structure parting to weak, fine, granular; weakly cemented; slightly brittle; most sand grains coated with organic matter; few fine roots; few root holes filled with clean sand grains; strongly acid; abrupt, wavy boundary.

A'2—10 to 28 inches, light yellowish-brown (2.5Y 6/4) loamy sand; common, fine, distinct, white (5Y 8/2) mottles; weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, wavy boundary.

B'21—28 to 44 inches, brownish-yellow (10YR 6/8) sandy loam; many, medium, distinct, white (5Y 8/2) mottles and few, medium, distinct, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; very friable; strongly acid; clear, wavy boundary.

B'22t—44 to 60 inches, brownish-yellow (10YR 6/6) sandy loam; common, medium, distinct, white (5Y 8/2) mottles and few, medium, distinct, reddish-yellow (5YR 6/8) mottles; weak, medium, subangular blocky structure; very friable; most sand grains coated and bridged with clay; strongly acid.

The A1 horizon ranges from gray to very dark gray. The organically stained Bh horizon ranges from dark brown to very dark gray. It is friable to brittle and weakly cemented, and it varies in consistence and degree of development within short horizontal distances. Thickness of the Bh horizon ranges from 4 to 8 inches. The depth to the B'21 horizon of sandy loam or sandy clay loam ranges from 28 to 35 inches.

In Appling and Jeff Davis Counties, nearly half the acreage of soils mapped in the Olustee series consists of soils that are outside the range defined for the series because their B'21 horizon is at a depth of more than 40 inches. This difference does not greatly alter the usefulness and behavior of these soils.

Olustee soils occur with the Leefield, Pelham, and Mascotte soils. They have an organically stained subsurface layer, which the Leefield and Pelham soils do not have. Also, they are not so wet as Pelham soils and have less clay in the subsoil than those soils. Olustee soils lack the prominent, gray, leached A2 horizon immediately above the organically stained horizon that is in the Mascotte soils.

Olustee sand (Oa).—This poorly drained soil is on lowland ridges in the Flatwoods. It is in areas that range from 10 to 50 acres in size. Slopes are less than 2 percent.

On about half the acreage mapped as this soil, the profile is similar to the one described as representative of the series. On slightly less than half the acreage, the depth to a layer of sandy loam or sandy clay loam is more than 40 inches.

In some places small areas of Mascotte, Leefield, and Pelham soils were included with this soil in mapping.

Because this soil is wet, it is not suited to all crops grown locally unless it is drained. The seasonal high water table fluctuates and is at a depth of 3 to 15 inches for 1 or 2 months a year. Planting is often delayed by wetness, and crops are damaged in some years by heavy rains in spring and summer. A system of ditches can remove much of the excess water, and land leveling and shaping can eliminate low spots. After the soil is drained, it is suited to such crops as corn, truck crops, and bahiagrass.

Mixing crop residue into the soil helps to maintain good tilth and the content of organic matter. An example of a suitable cropping system is 1 year of corn and 1 year of small grain. Row crops can be grown year after year, but some close-growing crops should be used occasionally in the cropping system.

About three-fourths of the acreage of this soil is wooded. Slash and longleaf pines are the principal trees, and there are some oaks (fig. 6). Capability unit IIIw-1; woodland suitability group 3w2.

Figure 6.—Typical ground cover under a stand of pines growing in Olustee sand.

Pelham Series

The Pelham series consists of poorly drained soils on broad flats and in slight depressions on lowlands. These soils formed in beds of loamy sediments. Slopes range from 0 to 3 percent.

In a representative profile, loamy sand extends from the surface to a depth of 26 inches. It is very dark gray in the upper part, light gray in the middle part, and white in the lower part. The subsoil, to a depth of about 42 inches, is gray sandy loam that is mottled with yellowish brown and pale yellow. The lower part of the subsoil is mottled gray and yellowish-brown sandy clay loam that extends to a depth of 60 inches.

These soils are low in natural fertility and organic-matter content, and they are very strongly acid throughout. The available water capacity is low to medium, and permeability is moderate. Tilth is fair to good. The depth of the root zone depends mainly on the depth of the water table during the growing season. The water table commonly is less than 15 inches below the surface for 2 to 6 months each year (fig. 7).

Figure 7.—**Unless it is drained, Pelham loamy sand is severely limited for cultivated crops because of ponding and a seasonal high water table.**

Pelham soils are the most extensive soils in Appling and Jeff Davis Counties. They are not suited to cultivation unless they are adequately drained. Almost all the acreage is woodland, a good use. The natural vegetation is chiefly mixed pines and an understory of swamp holly and native grasses.

Representative profile of Pelham loamy sand, in a wooded area, 75 yards northwest of west city limits of Surrency and 25 yards north from U.S. Highway No. 341, Appling County:

A1—0 to 2 inches, very dark gray (5Y 3/1) loamy sand; moderate, medium, granular structure; friable; many small roots; very strongly acid; abrupt, smooth boundary.

A21—2 to 12 inches, light-gray (10YR 7/1) loamy sand; weak, fine, granular structure; very friable; common, fine, brown stains along root holes; very strongly acid; gradual, wavy boundary.

A22—12 to 26 inches, white (2.5Y 8/2) loamy sand; many, fine, faint, pale-yellow mottles and common, medium, distinct, yellowish-brown (10YR 5/8) mottles; weak, fine, granular structure; very friable; pockets of sandy loam; many fine roots; very strongly acid; gradual, wavy boundary.

B1tg—26 to 42 inches, gray (N 6/0) sandy loam; many, medium, distinct, yellowish-brown (10YR 5/8) and pale-yellow (2.5Y 7/4) mottles; weak, fine, subangular blocky structure; friable; most sand grains coated with silt and clay; pockets of white loamy sand and yellowish-brown sandy loam; sand lenses are evident; few fine roots; very strongly acid; gradual, irregular boundary.

B2tg—42 to 60 inches, reticulately mottled gray (N 6/0) and yellowish-brown (10YR 5/8) sandy clay loam; weak, fine, subangular blocky structure; friable; few fine roots; sand lenses and pockets are evident; patchy clay films on some peds; very strongly acid.

A black O1 horizon is over the A1 horizon in some places. The A horizons range from 24 to 36 inches in combined thickness. The A1 horizon ranges from gray to very dark gray. Pockets of yellowish-brown sandy loam form the matrix of the A22 horizon in some places. The Bt horizons range from sandy loam to sandy clay loam.

Pelham soils occur mainly with the Surrency, Olustee, Albany, and Leefield soils. They have less organic matter in the surface layer than Surrency soils. The Pelham soils are slightly wetter than the Olustee soils and lack the

organically stained layer of those soils. They are wetter than the Albany and Leefield soils.

Pelham loamy sand (Pl).—This poorly drained soil typically is on broad flats and depressions in areas that range from 10 to 75 acres in size. Slopes range from 0 to 3 percent.

Included in mapping were small areas of a soil that is similar to this soil but has a surface layer of sandy loam. Also included were small areas of Leefield, Rains, and Surrency soils.

Because the water table fluctuates, this soil is wet in rainy periods. Bahiagrass and similar grasses and some kinds of cultivated crops, such as corn, can be grown if drainage is adequate and other good management practices are used. An example of a cropping system that is suitable where excess water has been removed is corn year after year. Crop residue should be shredded and returned to the soil to maintain the organic-matter content.

Almost all the acreage of this soil is woodland, a good use. Suitable trees grow well in areas where water does not pond. Examples of suitable trees are slash and loblolly pines, sycamore, and sweetgum. Capability unit IVw-4; woodland suitability group 2w3.

Rains Series

The Rains series consists of poorly drained soils along drainageways. These soils are subject to stream overflow and are covered by standing water for long periods of time. They formed in loamy sediments. Slopes range from 0 to 1 percent.

In a representative profile, the surface layer is dark-gray loam about 4 inches thick. This layer is underlain by about 11 inches of grayish-brown sandy loam. The subsoil, to a depth of about 31 inches, is gray sandy loam that is mottled with shades of brown. Between depths of 31 and 60 inches, the subsoil is gray sandy clay loam that is mottled with strong brown and light olive brown.

These soils are low in natural fertility and organic-matter content. They are very strongly acid throughout. Permeability is moderate, and the available water capacity is medium. Tilth ordinarily is poor because of wetness. The depth of the root zone depends largely on the depth to the water table during the growing season. The seasonal high water table is less than 15 inches below the surface for 6 to 12 months each year, and the soils are flooded more than once a year.

All of the acreage is woodland. Hardwoods are the main trees, and there are a few pines. Rains soils are severely limited for cultivated crops because they are so wet.

In Appling and Jeff Davis Counties, Rains soils are mapped only in an undifferentiated group with Johnston soils.

Representative profile of Rains loam, in an area of Johnston and Rains soils, along Whitehead Creek, 10 miles south-southwest of Courthouse, 1,000 feet east of Bell Telephone road, Jeff Davis County:

A1—0 to 4 inches, dark-gray (10YR 4/1) loam; weak, fine and medium, granular structure; very friable; very strongly acid; clear, wavy boundary.

A2—4 to 15 inches, grayish-brown (10YR 5/2) sandy loam; weak, medium, granular structure; very friable; brown stains in old root holes; very strongly acid; gradual, wavy boundary.

B1—15 to 31 inches, gray (10YR 6/1) sandy loam; few, medium, distinct, dark yellowish-brown (10YR 4/4) mottles and few, fine, distinct, strong-brown (7.5YR 5/8) mottles; weak, medium, subangular blocky structure; friable; common fine pores; very strongly acid; gradual, wavy boundary.

B2tg—31 to 60 inches, gray (10YR 6/1) sandy clay loam; common, medium, distinct, strong-brown (7.5YR 5/6) and light olive-brown (2.5Y 5/4) mottles; weak to moderate, medium, subangular blocky structure; firm; very strongly acid.

The A1 horizon ranges from 3 to 6 inches in thickness and is mostly dark gray or very dark gray in color. The B1 horizon is mostly sandy loam but contains pockets of sandy clay loam. It is gray to grayish brown. The lower part of the B2tg horizon ranges from clay loam to sandy clay loam and from light gray to gray. It is mottled with strong brown, light olive brown, and yellowish brown.

The Rains soils occur mainly with the Johnston soils. They lack the thick, black surface layer of the Johnston soils, and they contain more clay in the subsoil than those soils.

Sunsweet Series

The Sunsweet series consists of well-drained, eroded soils on uplands. These soils formed in mottled clayey material. Slopes range from 5 to 12 percent.

In a representative profile, the surface layer is very dark grayish-brown sandy loam about 4 inches thick. The subsoil is yellowish-red clay in the upper 7 inches. Below this and extending to a depth of 60 inches, the subsoil is highly mottled light-gray, dark-red, dusky-red, and yellowish-brown clay and sandy clay. Small and medium-sized, rounded pebbles of iron, 1/8 to 1 inch in diameter, are on the surface and in the soil to a depth of 24 inches.

Sunsweet soils are low in natural fertility and organic-matter content. They are very strongly acid throughout. The available water capacity is medium, and permeability is moderately slow. Tilth generally is poor, and the root zone is shallow for most plants.

The Sunsweet soils are not extensive, but they occur in both counties, mostly in the northern parts. Almost all of the acreage is covered by pines and a few oaks. These soils respond poorly to good management and are not generally suited to cultivated crops grown locally. They are moderately well suited to grasses and pine trees.

Representative profile of Sunsweet sandy loam, 5 to 12 percent slopes, eroded, in a wooded area 0.6 mile east of Coffee County line and 0.8 mile south of State Highway 107, Jeff Davis County:

Apcn—0 to 4 inches, very dark grayish-brown (10YR 3/2) sandy loam; weak, fine, granular structure; very friable; 30 percent small and medium-sized iron concretions 1/8 to 1 inch in diameter; many fine roots; very strongly acid; clear, wavy boundary.

B21t—4 to 11 inches, yellowish-red (5YR 4/6) clay; strong, medium, subangular blocky structure; firm; patchy clay films on some peds; few fine roots; 4 percent small and medium-sized iron concretions; 15 percent plinthite; very strongly acid; clear, wavy boundary.

B22t—11 to 24 inches, reticulately mottled dusky-red (10YR 3/4), yellowish-brown (10YR 5/8), and light-gray (10YR 7/2) clay; strong, medium, subangular blocky structure; firm; light-gray mottles are related to parent material, not to drainage; patchy clay films

on some peds; few fine roots; few pebbles; 5 percent plinthite; very strongly acid; clear, wavy boundary.

B23t—24 to 60 inches, reticulately mottled light-gray (10YR 7/2), dark-red (10R 3/6), dusky-red (10R 3/4), and yellowish-brown (10YR 5/8) sandy clay; mottles are many, coarse, and prominent; strong, coarse, subangular blocky structure; firm; light-gray mottles are related to parent material; patchy clay films on some peds; 20 percent plinthite; very strongly acid.

The Ap horizon ranges from 2 to 5 inches in thickness and from dark brown to very dark grayish brown and yellowish brown in color. The amount of iron concretions ranges from 5 to 35 percent in this horizon. The thin, mottle-free B21t horizon is absent in some places. The depth to the reticulately mottled horizons ranges from 9 to 24 inches but typically is about 12 inches.

The Sunsweet soils commonly occur with the Carnegie, Tifton, and Cowarts soils. They have shorter slopes, contain more clay in the subsoil, and have a thinner mottle-free layer above plinthite than the Carnegie, Tifton, and Cowarts soils.

Sunsweet sandy loam, 5 to 12 percent slopes, eroded (ShD2).—This soil is mainly in areas having abrupt breaks and short slopes, commonly at the head of small streams in the uplands. The areas range from 5 to 10 acres in size. Iron concretions about 1/8 to 1 inch in diameter are on the surface and are typical of this soil. In most areas the subsoil is exposed and rills and shallow gullies are common (fig. 8).

Included with this soil in mapping were some areas where slopes are less than 5 percent.

This soil is not suitable for cultivation. Because of slope, the abrupt breaks, and the hazard of erosion, it is not suited to field crops but is suited to pasture. Coastal bermudagrass, bahiagrass, and sericea lespedeza are forage plants that can be grown. Overgrazing should be avoided because erosion is a constant hazard.

Figure 8.—Bare areas in the foreground are typical of Sunsweet sandy loam, 5 to 12 percent slopes, eroded.

Almost all of this soil is in pine trees, a good use. Only a small acreage is in pasture. Capability unit VIe-2; woodland suitability group 3c2.

Surrency Series

The Surrency series consists of very poorly drained soils in depressional areas and drainageways where water movement is sluggish. These soils formed in beds of unconsolidated loamy sediments. Slopes are less than 2 percent.

In a representative profile, the surface layer is black loamy sand, about 12 inches thick, that is high in organic-matter content. Underlying this layer, to a depth of 32 inches, is grayish-brown and dark grayish-brown sand. The subsoil extends to a depth of 65 inches. It is mainly light-gray sandy loam mottled with brownish yellow in the upper part and is grayish-brown sandy clay loam mottled with shades of brown in the lower part.

These soils contain much organic matter in the surface layer but are low in natural fertility. They are extremely acid to very strongly acid throughout. Permeability is rapid in the upper part of the profile but moderate in the subsoil. The available water capacity is mainly medium. Tilth generally is poor because of wetness, and the depth of the root zone depends largely on the depth of the water table during the growing season.

Surrency soils are extensive in the two counties. All of the acreage is woodland consisting mainly of pines, pondcypress, blackgum, and sweetgum. The undergrowth is titi, swamp holly, sedges, and rushes. The suitability of these soils for cultivation is severely limited by wetness.

Representative profile of Surrency loamy sand, 4.1 miles northwest of Surrency, 0.3 mile north of old Baxley-Surrency road, Appling County:

O1—1 inch to 0, layer of spongy moss.

A1—0 to 12 inches, black (N 2/0) loamy sand; weak, fine and medium, granular structure; very friable; tongues of material from A2 horizon extend into this layer; many fine and medium roots; extremely acid; clear, irregular boundary.

A2—12 to 32 inches, grayish-brown (2.5Y 5/2) and dark grayish-brown (10YR 4/2) sand; single grained to weak, medium, granular structure; very friable; few fine and medium roots; few sand grains coated with brown, but most sand grains are clean; extremely acid; gradual, smooth boundary.

B21tg—32 to 48 inches, light-gray (10YR 7/2) sandy loam with pockets of loamy sand; common, medium, distinct, brownish-yellow (10YR 6/6) mottles; weak, medium, subangular blocky structure; very friable; some sand grains coated with clay; few fine roots; very strongly acid; gradual, wavy boundary.

B22tg—48 to 65 inches, grayish-brown (10YR 5/2) sandy clay loam; common, medium, distinct, yellowish-brown (10YR 5/8) and strong-brown (7.5YR 5/8) mottles; massive; sand grains coated with clay; very friable; very strongly acid.

The A1 horizon ranges from 10 to 14 inches in thickness and is black or very dark gray. The A2 horizon ranges from 20 to 28 inches in thickness and from grayish brown to white. It is not present in some places. The B21t horizon is sandy loam and is light gray or gray mottled with brownish yellow or yellowish brown. The B22t horizon is grayish brown or light brownish gray mottled with yellowish brown, brownish yellow, and strong brown.

The Surrency soils occur with the Bayboro and Pelham soils and, to a lesser extent, with the Olustee, Mascotte, and Leefield soils at a higher elevation. Surrency soils are more poorly drained and contain more organic matter than the Pelham soils. They lack the cemented organic layer that is common in the Mascotte soils. They have a thicker sandy A horizon than the Bayboro soils. Surrency soils are wetter and have a higher content of organic matter in the surface layer than the Olustee and Leefield soils.

Surrency loamy sand (Sv).—This very poorly drained soil typically is in depressional areas and drainageways that range from 10 to 50 acres in size. Slopes range from 0 to slightly less than 2 percent.

Included with this soil in mapping were small areas of Bayboro, Pelham, Olustee, and Leefield soils. Small areas of soils that have black mucky sand in the surface layer were also included.

This soil is flooded more than once each year for periods of 1 to 6 months. The seasonal high water table is at a depth of less than 15 inches for more than 6 months each year. Because the soil is wet and is subject to flooding, it is not cultivated.

The acreage of this soil is entirely woodland, a good use. Native plants provide some forage, but pasture could be grown if the soil were adequately drained and well managed. Generally, however, extensive drainage is impractical. Capability unit Vw-2; woodland suitability group 2w9.

Tifton Series

The Tifton series consists of well-drained, nearly level to very gently sloping soils that have many iron concretions on the surface. These soils are mostly on broad, smooth ridges. They formed in thick beds of loamy to clayey materials. Slopes range from 0 to 5 percent.

In a representative profile, the surface layer is very dark grayish-brown loamy sand about 9 inches thick. The subsoil, to a depth of 34 inches, is yellowish-brown sandy loam and sandy clay loam. Below this layer, and extending to a depth of 70 inches, the subsoil is strong-brown and brownish-yellow sandy clay loam that is mottled with dark red, yellowish red, and light gray.

These soils are low in natural fertility and organic-matter content. They are very strongly acid to strongly acid throughout. The available water capacity is medium, and permeability is moderate. Tilth is good, and the root zone is deep.

Tifton soils are extensive in Appling and Jeff Davis Counties, and slightly more than half the acreage is woodland. The chief trees are pines, and there are a few oaks. These soils respond well to good management and are suited to many kinds of crops.

Representative profile of Tifton loamy sand, 2 to 5 percent slopes, in a cultivated area, 2.5 miles south of Piney Grove Church on north side of county road, Appling County:

Apcn—0 to 9 inches, very dark grayish-brown (10YR 3/2) loamy sand; weak, fine and medium, granular structure; very friable; many, small, hard iron concretions; few small quartz pebbles; many fine roots; very strongly acid; abrupt, smooth boundary.

B1cn—9 to 16 inches, yellowish-brown (10YR 5/8) sandy loam; weak, fine, subangular blocky structure; very friable; 20 percent small iron concretions; few fine and medium roots; strongly acid; gradual, wavy boundary.

B21tcn—16 to 34 inches, yellowish-brown (10YR 5/8) sandy clay loam; weak, medium, subangular blocky struc-

ture; friable; less than 5 percent plinthite; clay films on peds; 10 percent iron concretions; very strongly acid; gradual, wavy boundary.

B22t—34 to 48 inches, strong-brown (7.5YR 5/8) sandy clay loam; few, medium, prominent, dark-red (2.5YR 3/6) mottles; moderate, medium, subangular blocky structure; friable; few iron concretions; 10 percent plinthite; clay films on peds; very strongly acid; gradual, wavy boundary.

B23t—48 to 70 inches, brownish-yellow (10YR 6/8) sandy clay loam; few, medium, distinct, light-gray (2.5Y 7/2) mottles and common, prominent, yellowish-red (5YR 5/6) mottles; moderate, medium, subangular blocky structure; friable; 3 percent plinthite; common, small, clean sand grains; very strongly acid; gradual, wavy boundary.

The A horizon ranges from 6 to 16 inches in thickness. Content of small, brown concretions of iron ranges from 5 to about 20 percent in this horizon and in the upper part of the B horizon. The B2t horizons are brownish yellow to strong brown in the upper 48 inches, and they are mottled with shades of red, yellow, and gray in the lower part. Plinthite in excess of 5 percent begins at a depth of 34 to 48 inches. The maximum content of plinthite is estimated to range from 10 to 20 percent.

The Tifton soils commonly occur with the Norfolk, Carnegie, Irvington, and Fuquay soils. They closely resemble the Norfolk soils, but they contain more than 5 percent plinthite in the B22t horizon. Also, Tifton soils have many more iron pebbles throughout the profile than the Norfolk soils. Unlike the Carnegie soils, Tifton soils contain less than 5 percent plinthite in the upper 34 inches of the profile. They are better drained than the Irvington soils, and they lack the distinct fragipan of those soils. Tifton soils lack the thick sandy A horizon that is common in the Fuquay soils.

Tifton loamy sand, 0 to 2 percent slopes (TqA).—This well-drained soil occupies broad interstream ridges. It is in areas that range from 10 to 50 acres in size.

Small areas of Norfolk and Fuquay soils were included with this soil in mapping.

If this soil is well managed, it can be farmed intensively because it has no special limitations that affect management. It is well suited to all crops grown locally, such as corn, tobacco, cotton, soybeans, peanuts, small grain, Coastal bermudagrass, bahiagrass, crimson clover, and sericea lespedeza. This soil is also suited to trees.

Erosion is not a hazard, but crop residue should be used for surface cover when the soil is not protected by plants. The return of organic matter to the soil aids in maintaining good tilth and organic-matter content.

Row crops can be grown year after year without excessive soil loss. However, cropping systems that rotate crops and utilize crop residue generally result in the best response from crops and the least trouble from disease and pests. Capability unit I-2; woodland suitability group 2o1.

Tifton loamy sand, 2 to 5 percent slopes (TqB).—This soil typically is in large areas, some as much as 40 acres in size, on ridges between streams. A profile of this soil is described as representative of the Tifton series.

Included with this soil in mapping were a few shallow gullies and some areas where the surface layer is less than 6 inches thick. Small areas of Carnegie, Norfolk, and Fuquay soils were also included.

The soil responds well to good management. It is well suited to all crops grown locally, including corn, tobacco, cotton, soybeans, peanuts, small grain, millet, Coastal bermudagrass, bahiagrass, crimson clover, and sericea lespedeza. The soil also is well suited to pasture plants and pine trees.

Surface runoff is generally rapid enough to remove soil material if fields are cultivated and not protected. Erosion can be controlled by the use of terraces, contour farming, waterways, and a supporting system of crop management. An example of a suitable cropping system, for a field that is terraced and contour cultivated and where slopes are about 4 percent, is 1 year of cotton and 1 year of small grain. Both crops should be highly fertilized, and crop residue should be shredded and left on the surface between crops (fig. 9).

Slightly less than half the acreage of this soil is used for cultivated crops or pasture. Capability unit IIe-2; woodland suitability group 2o1.

Troup Series

The Troup series consists of well-drained to somewhat excessively drained soils on uplands. These soils formed in thick beds of unconsolidated sandy and loamy materials. Slopes range from 0 to 12 percent.

In a representative profile, sand extends from the surface to a depth of about 50 inches. It is dark gray in the upper part, yellowish brown and light olive brown in the middle part, and light yellowish brown in the lower part. The next layer is mainly brownish-yellow loamy sand and sandy loam about 9 inches thick. Between depths of 59 and 80 inches is brownish-yellow sandy clay loam that is mottled with shades of red and brown.

Troup soils are low in natural fertility, organic-matter content, and available water capacity. They are very strongly acid throughout. Permeability is rapid in the uppermost 56 inches and moderate below that depth. The root zone is deep, and tilth is good.

The Troup soils are extensive in the two counties. About three-fourths of the acreage is in natural vegetation consisting of scattered longleaf pine, many scrub oaks, and wiregrass. Because they are droughty, these soils are not well suited to most crops grown locally.

Troup soils occur separately as well as in a complex with Wicksburg soils.

Representative profile of Troup sand, 0 to 5 percent slopes, 0.5 mile northwest of an unnamed church, 1 mile south-southeast of St. Matthew Church, Jeff Davis County:

A1—0 to 3 inches, dark-gray (10YR 4/1) sand; weak, fine, granular structure; loose; many fine and medium roots; very strongly acid; gradual, smooth boundary.

A21—3 to 14 inches, yellowish-brown (10YR 5/4) sand; single grained; loose; few fine and medium roots; very strongly acid; gradual, wavy boundary.

A22—14 to 36 inches, light olive-brown (2.5Y 5/4) sand; single grained; loose; few fine roots; very strongly acid; gradual, wavy boundary.

A23—36 to 50 inches, light yellowish-brown (2.5Y 6/4) sand; single grained; loose; few fine roots; very strongly acid; gradual, wavy boundary.

A24 & B1—50 to 56 inches, brownish-yellow (10YR 6/6) and light yellowish-brown (2.5Y 6/4) loamy sand; weak, fine, granular structure; very friable; very strongly acid; gradual, wavy boundary.

B21t—56 to 59 inches, brownish-yellow (10YR 6/6) sandy loam; weak, fine, subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid; gradual, wavy boundary.

B22t—59 to 70 inches, brownish-yellow (10YR 6/6) sandy clay loam; weak, medium, subangular blocky struc-

Figure 9.—**Area of Tifton loamy sand, 2 to 5 percent slopes, where cornstalks and residue from native grasses provide a cover in winter.**

ture; friable; sand grains coated and bridged with clay: very strongly acid; gradual, wavy boundary.

B23t—70 to 80 inches, brownish-yellow (10YR 6/6) sandy clay loam; medium, prominent, red (2.5YR 4/6) and strong-brown (7.5YR 5/8) mottles; weak, fine and medium, subangular blocky structure; friable; sand grains coated and bridged with clay; very strongly acid.

The sandy A horizons range from 48 to 59 inches in combined thickness. The A1 horizon ranges from dark gray to dark grayish brown. The B21t and B22t horizons range from yellowish brown to brownish yellow.

The Troup soils commonly occur with the Cowarts, Wicksburg, and Kershaw soils. The Troup soils have a thicker and more sandy A horizon than the Cowarts soils, and they do not contain plinthite. They are less clayey in the subsoil than the Wicksburg soils. Troup soils have a finer textured subsoil than the sandy Kershaw soils.

Troup sand, 0 to 5 percent slopes (TpB).—This is a well-drained to somewhat excessively drained soil on uplands. Typically, it is on broad ridgetops in areas that range from 10 to 50 acres in size. It has the profile described as representative of the Troup series.

Included with this soil in mapping were small areas of Kershaw and Wicksburg soils.

This soil is somewhat limited for farming by its sandy nature. It is suited to corn, peanuts, small grain, truck crops, and hay and pasture crops. Coastal bermudagrass and bahiagrass can be grown successfully if management is good. Split applications of fertilizer are advisable because leaching is excessive.

Droughtiness is the most important limitation if crops are grown. Erosion ordinarily is not a hazard, but management that tends to concentrate a large quantity of runoff should be avoided because gullying is a hazard. All crop residue should be returned to the soil because the additional organic matter helps to maintain the available water capacity and reduce gullying. An example of a suitable cropping system is 2 years of corn and 1 year of peanuts grown in fields that are contour-cultivated.

Most of the acreage is in scrub oaks and scattered longleaf pines. Capability unit IIIs-1; woodland suitability group 3s2.

Troup-Wicksburg complex, 8 to 12 percent slopes (TWD).—This mapping unit consists of Troup and Wicksburg soils on choppy, uneven landscapes. These soils are intermingled in such intricate patterns that it is not practical to map them separately.

The Troup soils make up about 50 percent of the complex; Wicksburg soils, about 40 percent; and other soils, the rest. The pattern and proportionate extent of the major soils are reasonably consistent from one mapped area to another.

The profile of the Troup soils in this mapping unit is similar to the one described as representative of the Troup series, but in some places the surface layer is coarse sand or fine sand. The profile of the Wicksburg soil is similar to the one described as representative for

the Wicksburg series, but the surface layer is not gravelly in some areas.

Included with this complex in mapping were small areas of rock outcrop. In a few places, gall spots and a few shallow gullies also were included.

Droughtiness and slope generally cause these soils to be unsuitable for cultivation. Some areas, however, can be planted to Coastal bermudagrass or bahiagrass for hay or pasture. Because gullying is a hazard on unprotected slopes, pastures should not be overgrazed.

Most of the acreage is in natural vegetation consisting of scrub oaks and scattered pine trees. Capability unit VIs-1; woodland suitability group 3s2.

Wahee Series

The Wahee series consists of somewhat poorly drained, nearly level soils on terraces along the Altamaha and Ocmulgee Rivers. These soils formed in old alluvial deposits of clay.

In a representative profile, the surface layer is dark grayish-brown silty clay loam, about 3 inches thick, that is mottled with yellowish red. The subsoil is silty clay that extends to a depth of 60 inches. It is brown in the upper part, light brownish gray in the middle part, gray in the lower part, and mottled with yellowish brown throughout.

These soils are mainly low in natural fertility and organic-matter content. They are very strongly acid throughout. The available water capacity is medium, and permeability is slow. The root zone is chiefly moderately deep, and tilth is poor.

Almost all the acreage of Wahee soils is in pine and hardwood trees, a good use. These soils are poorly suited to cultivated crops because they have a seasonal high water table and are subject to flooding.

In Appling and Jeff Davis Counties, Wahee soils are mapped only in an undifferentiated group with Coxville soils.

Representative profile of Wahee silty clay loam, in an area of Wahee and Coxville soils, 1,500 feet southeast of natural gas line where it crosses the Ocmulgee River, near McEachins Landing, Jeff Davis County:

A1—0 to 3 inches, dark grayish-brown (10YR 4/2) silty clay loam; common, fine, distinct, yellowish-red (5YR 4/6) mottles; weak, fine, subangular blocky structure; friable; few to common fine mica flakes; many fine roots; very strongly acid; clear, wavy boundary.

B21t—3 to 10 inches, brown (7.5YR 4/4) silty clay; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; moderate, medium, subangular blocky structure; firm; few to common fine mica flakes; common fine roots; very strongly acid; gradual, wavy boundary.

B22t—10 to 40 inches, light brownish-gray (2.5Y 6/2) silty clay; common, medium, distinct, yellowish-brown (10YR 5/6) mottles; moderate, medium, subangular blocky structure; very firm; clay films on vertical surfaces of peds; few to common fine mica flakes; few fine roots; very strongly acid; gradual, wavy boundary.

B23tg—40 to 60 inches, gray (5Y 6/1) silty clay; common, medium, distinct, yellowish-brown (10YR 5/4) mottles; moderate, medium, subangular blocky structure; very firm; clay films on vertical surfaces of peds; few to common fine mica flakes; very strongly acid.

The A horizon ranges from 2 to 6 inches in thickness and from dark grayish brown to brown in color. This horizon is mainly silty clay loam in texture but ranges to silty clay. The B horizons generally are silty clay but in places are clay.

The Wahee soils occur with the Coxville and Johns soils. Wahee soils are better drained than the Coxville soils. They are not so well drained as the Johns soils, and their B22t horizon is grayer than the one in those soils.

Wahee and Coxville soils (WW).—These soils are on stream terraces, mainly along the Altamaha and Ocmulgee Rivers. The soils occur in irregular patterns. Most areas of the mapping unit consist of both soils, but some contain only one. The mapping unit is about 60 percent Wahee soils, 30 percent Coxville soils, and 10 percent included soils. Slopes range from 0 to 2 percent.

The Wahee soils are in small, slightly elevated areas and are better drained than the Coxville soils. The surface layer of Wahee soils is brown recent overwash that ranges from silty clay to silty clay loam. One of these soils has the profile described as representative for the Wahee series.

The Coxville soils are in slightly depressed swales and drainageways. Their surface layer is mainly very dark gray silty clay loam that receives a thin layer of material each time the soils are flooded. In other respects, their profile is similar to the one described as representative for the Coxville series.

The soils in this mapping unit are flooded for periods in winter and spring and early in summer, and this is likely to damage row crops (fig. 10). Unless the soils are drained and protected from flooding, they are poorly suited to cultivated crops but are suited to pasture. Bahiagrass is more suitable for pasture than other grasses commonly grown in the two counties. If these soils were adequately drained and protected, they could be farmed year after year, though crop response would be only fair. In their present condition, the soils are suited to trees, including loblolly and slash pines and sweetgum. Capability unit IVw-4; woodland suitability group 2w8.

Wicksburg Series

The Wicksburg series consists of well-drained soils on uplands. These soils formed in beds of clayey materials. They occur in fairly small areas where the landscape is irregular. Slopes range from 2 to 12 percent.

In a representative profile, the surface layer is dark-gray gravelly coarse sand about 5 inches thick. It is underlain by about 19 inches of light olive-brown coarse sand. The subsoil is brownish-yellow coarse sandy loam and sandy clay to a depth of about 32 inches. Below this layer, the subsoil is mottled yellowish-brown, red, light-gray, and white sandy clay that extends to a depth of 60 inches.

These soils are low in natural fertility, available water capacity, and organic-matter content. They are very strongly acid throughout. The permeability is very rapid in the uppermost 24 inches and moderately slow in the main part of the subsoil. The root zone is deep, and tilth is fair.

The Wicksburg soils are extensive, and more than three-fourths of the acreage is in pine and scrub oak trees. Crop response is generally poor because these soils are droughty.

Representative profile of Wicksburg gravelly coarse

***Figure 10.*—Floodwater from the Ocmulgee River covers an area of Wahee and Coxville soils.**

sand, 2 to 8 percent slopes, in a wooded area, 500 feet northwest of Altamaha School, Jeff Davis County:

A1—0 to 5 inches, dark-gray (10YR 4/1) gravelly coarse sand; weak, fine, granular structure; very friable; 20 percent small and medium quartz gravel; few, small, dark-brown iron concretions; many fine roots; very strongly acid; abrupt, clear boundary.

A2—5 to 24 inches, light olive-brown (2.5Y 5/4) coarse sand; single grained; loose; 10 percent small quartz gravel; 3 percent iron concretions; few fine roots; very strongly acid; clear, wavy boundary.

B1—24 to 28 inches, brownish-yellow (10YR 6/6) coarse sandy loam; weak, fine, subangular blocky structure; very friable; 5 percent gravel and iron concretions; few fine roots; very strongly acid; abrupt, smooth boundary.

B21t—28 to 32 inches, brownish-yellow (10YR 6/6) sandy clay; weak, medium, subangular blocky structure; friable; 5 percent gravel and iron concretions; sand grains bridged with clay; very strongly acid; gradual, wavy boundary.

B22t—32 to 46 inches, mottled yellowish-brown (10YR 5/6), red (2.5YR 5/8), and light-gray (10YR 7/1) sandy clay; mottles are many, coarse, and prominent; weak, medium, subangular blocky structure; friable; patchy clay films on some peds; very strongly acid; gradual, wavy boundary.

B23t—46 to 53 inches, coarsely mottled yellowish-brown (10YR 5/8), red (2.5YR 4/8), and white (10YR 8/1)

sandy clay; moderate, medium, subangular blocky structure; firm, slightly brittle; patchy clay films on some peds; very strongly acid; gradual, wavy boundary.

B24t—53 to 60 inches, coarsely mottled yellowish-brown (10YR 5/8), red (2.5YR 4/8), and white (10YR 8/1) sandy clay; weak, medium, subangular blocky structure; friable; sand grains bridged with clay; very strongly acid.

The A horizons range from 21 to 32 inches in combined thickness and are coarse sand and gravelly coarse sand. The A1 horizon ranges from very dark gray to dark grayish brown. The B22t horizon ranges from yellowish brown to strong brown and from sandy clay to sandy clay loam. The quantity of quartz gravel on the surface and throughout the sandy A horizon ranges from 10 to 25 percent.

Wicksburg soils occur with the Troup and Cowarts soils. They have thinner A horizons and more clayey B horizons than the Troup soils. They have thicker, more sandy A horizons and more clayey B horizons than the Cowarts soils. Also, Wicksburg soils do not contain plinthite in the subsoil as do the Cowarts soils.

Wicksburg gravelly coarse sand, 2 to 8 percent slopes (WvC).—This soil is on uplands in areas that range from 5 to 25 acres in size. A profile of this soil is described as representative of the Wicksburg series.

Small areas of Troup, Cowarts, and Fuquay soils were included with this soil in mapping.

This Wicksburg soil is poorly suited to the crops grown locally, such as cotton, corn, tobacco, and small grain, and to hay and pasture plants. Coastal bermudagrass and bahiagrass can be grown successfully if management is good.

Droughtiness is the most important limitation if crops are grown. Maintaining the organic-matter content of the soil helps to maintain the available water capacity and to reduce leaching of fertilizer. Split applications of fertilizer also help to reduce losses through leaching. Erosion is not generally a hazard, because the intake rate is high. Soil loss can be controlled by keeping plant residue on or in the surface layer, cultivating on the contour, stripcropping, and rotating cultivated crops with perennial grasses. Management that tends to concentrate a large quantity of runoff should be avoided because gullying is a hazard. An example of a suitable cropping system is 2 years of corn, or a similar row crop, and 1 year of peanuts and a winter cover of rye. Fields should be contour cultivated, and all crop residue should be left on the soil.

Most of the acreage is woodland. Capability unit IVs-1; woodland suitability group 3s2.

Use and Management of the Soils

This section contains interpretations about the predicted behavior of the soils in Appling and Jeff Davis Counties under specified conditions of use and management. The interpretations are for soils used for cultivated crops and pasture, woodland, wildlife habitat, engineering purposes, and town and country planning. Changing economic conditions, new techniques of farm management, new machines and materials, and improved crop varieties are some of the things that affect the behavior of the soils and influence their use and management. These factors must be considered when the interpretations in this section are applied.

Use of the Soils for Cultivated Crops and Pasture

In this section, general practices of management are discussed, the system of capability grouping used by the Soil Conservation Service is explained, and each capability unit in the two counties is briefly described. In addition, estimated acre yields of the principal crops under a high level of management are given for the soils in the two counties, and the management required to obtain these yields is described. Suitable management practices for each soil are suggested in the discussions of the mapping units in the section "Descriptions of the Soils."

General practices of management [2]

Controlling erosion, removing excess water, and maintaining good tilth and productivity are the most common needs in the management of farmland in Appling and Jeff Davis Counties.

Many of the soils in the two counties, such as the Cowarts and Carnegie soils, are susceptible to erosion. The degree of susceptibility depends on the erodibility of the soil, the frequency and intensity of rainfall, and the steepness and length of slopes. These properties determine whether the farmer uses straight rows, contour cultivation with or without terraces, or stripcropping. The more gently sloping soils may need only contour cultivation and a cropping system that provides medium to large amounts of crop residue. Steeper soils or soils that have significant slopes may need a combination of straight-row farming, contour farming without terraces, or stripcropping, and a cropping system that includes annual close-growing crops, crops that produce a large amount of residue, or perennial crops. Regardless of the practice used, a grassed waterway or outlet is essential.

The main need of some of the soils, especially the sandy ones, is the return of large amounts of crop residue, which should be well managed. Cropping systems that include perennial grasses or legumes are beneficial. Stripcropping and contour cultivation are also important on sandy soils.

Excess water is the main limitation on several soils, such as the Albany and Pelham soils. The type of drainage system needed depends on the amount of water in the soil and the kinds of crops grown. After the water is controlled, only practices that help to maintain productivity and good tilth are needed.

Several management practices contribute to maintenance or improvement of soil productivity and good tilth and help prevent soil losses. Among these are regular applications of lime and fertilizer according to plant needs, as indicated by soil testing; good management of crop residue, usually by shredding the residue and leaving it on the soil surface between seasons of crop production; and the use of suitable cropping systems.

Complementary practices are beneficial to the soils of the two counties. Grassed waterways or outlets are essential for the disposal of runoff water from straight-row farming, contour farming, terraces, or stripcropping. A field border of perennial grass is needed to reduce weed

[2] JOHN B. HUNGERFORD, conservation agronomist, Soil Conservation Service, assisted in preparing this section.

growth and to prevent erosion at some locations at the edge of fields. Such a border is attractive and allows more efficient operation of farm equipment. Farm roads and fences should be located on the crest of the slopes, where the watershed divides, or on the contour. Fences may also be located in or adjacent to natural waterways. Farm roads and fences should permit field and row arrangement that will facilitate efficient farming operations.

Capability grouping of soils

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The soils are grouped according to their limitations when used for field crops, the risk of damage when they are so used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soil; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forest trees or engineering.

In the capability system, the kinds of soils are grouped at three levels, the capability class, subclass, and unit. These are discussed in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States but not in Appling and Jeff Davis Counties, shows that the chief limitation is climate that is too cold or too dry.

In Class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in Class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture, range, woodland, wildlife habitat, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-2 or IVe-4. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitations; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass. The capability units are not numbered consecutively, because all the units used in Georgia are not represented in these two counties.

The eight classes in the capability system and the subclasses and units in Appling and Jeff Davis Counties are described in the list that follows. The capability classifiation and suggestions for use and management of the soils are given in the descriptions of the mapping units.

Class I. Soils that have few limitations that restrict their use.
- Unit I-1. Nearly level, well-drained soils that have a sandy surface layer and loamy subsoil, on stream terraces and uplands.
- Unit I–2. Nearly level, well-drained soil that has a sandy surface layer and loamy subsoil and contains iron concretions, on uplands.

Class II. Soils that have moderate limitations that reduce the choice of plants or require moderate conservation practices.
- Subclass IIe. Soils subject to moderate erosion if they are not protected.
  - Unit IIe-1. Very gently sloping, well-drained soil that has a sandy surface layer and loamy subsoil, on uplands.
  - Unit IIe-2. Very gently sloping, well-drained soil that has a sandy surface layer and loamy subsoil and contains iron concretions, on uplands.
  - Unit IIe-3. Very gently sloping, moderately well drained to somewhat poorly drained soils that have a sandy surface layer and a mainly clayey subsoil, on uplands.
  - Unit IIe-4. Very gently sloping, well-drained soils that have a sandy surface layer, a loamy subsoil, and a layer that contains plinthite at a depth of about 22 inches, on uplands.
- Subclass IIw. Soils that have moderate limitations because of excess water.
  - Unit IIw-2. Nearly level, moderately well drained and somewhat poorly drained soils that have a sandy to loamy surface layer and a mainly loamy subsoil, on uplands and stream terraces.
- Subclass IIs. Soils that have moderate limitations mainly because of low available water capacity.
  - Unit IIs-1. Nearly level to very gently sloping soil that is sandy to a depth of about 22 inches but has a loamy subsoil, on uplands.

Class III. Soils that have severe limitations that reduce the choice of plants, require special conservation practices, or both.
- Subclass IIIe. Soils subject to severe erosion if they are cultivated and not protected.
  - Unit IIIe–3. Gently sloping, moderately well drained soil that has a sandy surface layer and a clayey subsoil, on uplands.

Subclass IIIw. Soils that have severe limitations because of excess wetness.

Unit IIIw-1. Nearly level, somewhat poorly drained soils that are sandy to a depth of about 28 to 44 inches and have a loamy subsoil, on broad, wet plains and low ridges.

Unit IIIw-2. Nearly level, somewhat poorly drained soil that has a sandy surface layer and loamy subsoil, on uplands.

Subclass IIIs. Soils that have severe limitations mainly because of low available water capacity.

Unit IIIs-1. Nearly level to very gently sloping soil that is sandy to a depth of about 50 inches but has a loamy subsoil, on uplands.

Class IV. Soils that have very severe limitations that restrict the choice of plants, require very careful management, or both.

Subclass IVe. Soils subject to very severe erosion if they are cultivated and not protected.

Unit IVe-4. Gently sloping, well-drained soils that have a sandy surface layer, a loamy subsoil, and a layer that contains plinthite at a depth of about 22 inches, on uplands.

Subclass IVw. Soils that have very severe limitations because of excess water.

Unit IVw-4. Poorly drained to somewhat poorly drained soils that have a loamy or sandy surface layer and loamy or clayey layers in the subsoil, in drainageways, on broad flats, and on stream terraces.

Subclass IVs. Soils that have very severe limitations because of physical properties.

Unit IVs–1. Very gently sloping to gently sloping, droughty soil that is sandy to a depth of about 24 inches but has loamy and clayey layers in the subsoil, on uplands.

Class V. Soils that are not likely to erode but have other limitations, impractical to remove, that limit their use largely to pasture, range, woodland, or wildlife habitat.

Subclass Vw. Soils that are too wet for cultivation, in areas where drainage or protection from flooding is not feasible.

Unit Vw-1. Poorly drained and very poorly drained soils that have a loamy surface layer and a clayey subsoil, in depressions and ponded areas.

Unit Vw-2. Poorly drained and very poorly drained soils that have a sandy or loamy surface layer and a loamy subsoil, mainly on flood plains and in depressions.

Unit Vw-4. Poorly drained, nearly level soil that has an organically cemented layer below the surface layer, on low uplands.

Class VI. Soils that have severe limitations that make them generally unsuitable for cultivation and limit their use largely to pasture, range, woodland, or wildlife habitat.

Subclass VIe. Soils that are severely limited, chiefly by the risk of erosion unless protective cover is maintained.

Unit VIe-2. Strongly sloping soils that have a loamy or sandy surface layer and a chiefly clayey subsoil, on uplands.

Subclass VIs. Soils that are generally unsuitable for cultivation and are limited for other uses by their low available water capacity or by other physical characteristics.

Unit VIs-1. Strongly sloping, well-drained to somewhat excessively drained soils that have a sandy surface layer and a loamy to clayey subsoil, on uplands.

Class VII. Soils that have have very severe limitations that make them unsuitable for cultivation and that restrict their use largely to limited grazing, woodland, or wildlife habitat.

Subclass VIIs. Soils that are unsuitable for cultivation and are very limited for other uses by their very low available water capacity.

Unit VIIs-1. Very gently sloping to gently sloping, droughty, sandy soils, on uplands.

Class VIII. Soils and landforms that have limitations that preclude their use for commercial plants and restrict their use to recreation, wildlife habitat, water supply, or esthetic purposes. (There are no Class VIII soils in Appling and Jeff Davis Counties.)

Estimated yields

Table 2 lists the estimated average yields per acre of the principal crops and pasture grasses grown in Appling and Jeff Davis Counties. These are yields that can be expected under a high level of management that does not include irrigation. The estimates are for the entire survey area, not for any particular farm or tract. They are based chiefly on observations made during the fieldwork for the survey, on interviews with farmers, on information obtained from other agricultural workers familiar with the soils and crops in the two counties, on field trials, and if available, on other records of crop yields.

The yields listed in table 2 can be obtained by—

1. Preparing an adequate seedbed.
2. Applying fertilizer and lime according to the needs indicated by soil tests.
3. Planting or seeding by suitable methods at a suitable rate and at the right time.
4. Selecting high-yielding varieties of crops and hybrids and using crops that leave a large amount of residue.
5. Using cropping systems that conserve the soil, preferably those suggested in the descriptions of the mapping units.
6. Controlling water by means of terraces, contour cultivation, drainage, vegetated waterways, or stripcropping.
7. Controlling weeds, insect pests, and plant diseases.

The rates of fertilization and planting as well as other management practices needed to obtain the yields given in table 2 are shown, by crops, in the following paragraphs. The amounts of fertilizer are on a per acre basis. In all cases, lime is applied according to the needs indicated by soil tests.

TABLE 2.—*Estimated average yields per acre of the principal crops under a high level of management*

[Management does not include irrigation, except that supplemental irrigation commonly used for tobacco. Dashes indicate that the crop is not suited to the soil specified or is not commonly grown on it]

Soil	Corn	Tobacco (flue-cured)	Cotton (lint)	Small grain for pasture	Coastal bermudagrass for hay	Coastal bermudagrass for pasture	Bahiagrass for pasture
	Bu.	*Lb.*	*Lb.*	*A.U.M.*[1]	*Tons*	*A.U.M.*[1]	*A.U.M.*[1]
Albany sand	65	2,200	450	3.5	4.5	8.0	7.0
Bayboro loam	---	---	---	---	---	---	---
Cahaba loamy sand	90	2,200	725	4.5	5.5	9.5	8.5
Carnegie loamy sand, 2 to 5 percent slopes	70	1,500	700	4.0	5.0	8.5	8.0
Carnegie loamy sand, 5 to 8 percent slopes	55	1,400	500	4.0	4.5	6.5	7.0
Cowarts loamy sand, 2 to 5 percent slopes	65	1,600	600	4.0	5.0	8.5	8.0
Cowarts loamy sand, 5 to 8 percent slopes	55	1,400	550	4.0	4.5	6.5	7.0
Coxville loam	---	---	---	---	---	---	5.0
Dunbar loamy sand, 2 to 5 percent slopes	55	---	---	3.5	4.5	6.0	6.0
Dunbar loamy sand, 5 to 12 percent slopes	---	---	---	---	---	6.0	6.0
Duplin loamy sand, 2 to 5 percent slopes	55	1,100	400	3.5	4.5	8.0	7.5
Duplin loamy sand, 5 to 8 percent slopes	45	1,000	375	3.5	4.5	8.0	7.5
Fuquay loamy sand, 0 to 5 percent slopes	75	2,300	600	4.5	5.0	8.5	7.0
Hazlehurst loamy sand	80	2,500	600	4.0	5.5	9.0	8.5
Irvington loamy sand	80	2,300	650	4.5	6.0	9.5	9.0
Johns sandy loam	65	2,000	---	---	4.5	8.0	7.5
Johnston and Rains soils	---	---	---	---	---	---	5.0
Kershaw sand, 2 to 8 percent slopes	---	---	---	---	2.5	3.5	4.0
Leefield loamy sand	70	2,500	500	4.0	6.0	9.0	8.0
Leefield soils	70	2,500	500	4.0	6.0	9.0	8.0
Mascotte sand	---	---	---	---	4.0	7.0	7.0
Norfolk loamy sand, 0 to 2 percent slopes	85	2,500	675	4.5	6.0	10.0	8.5
Norfolk loamy sand, 2 to 5 percent slopes	80	2,500	675	4.5	6.0	10.0	8.5
Olustee sand	75	2,200	500	4.0	4.5	8.0	8.0
Pelham loamy sand	55	---	---	---	---	---	6.5
Sunsweet sandy loam, 5 to 12 percent slopes, eroded	---	---	---	---	---	4.5	4.5
Surrency loamy sand	---	---	---	---	---	---	---
Tifton loamy sand, 0 to 2 percent slopes	85	2,500	750	4.5	6.0	10.0	8.5
Tifton loamy sand, 2 to 5 percent slopes	80	2,500	750	4.5	6.0	10.0	8.5
Troup sand, 0 to 5 percent slopes	50	---	---	4.0	4.0	6.5	7.0
Troup-Wicksburg complex, 8 to 12 percent slopes:							
Troup soil	---	---	---	---	4.0	6.0	6.5
Wicksburg soil	---	---	---	---	4.5	7.0	7.0
Wahee and Coxville soils	---	---	---	---	---	---	6.5
Wicksburg gravelly coarse sand, 2 to 8 percent slopes	50	1,400	450	4.0	4.5	7.5	7.0

[1] Animal-unit-months is a term used to express the carrying capacity of pasture. It is the number of months during the year that 1 acre will provide grazing for 1 animal unit (one cow, one horse, one mule, five sheep, or five goats) without damage to the pasture.

Corn receives 25 to 35 pounds of nitrogen (N), 60 to 70 pounds of phosphoric acid (P_2O_5), and 75 to 105 pounds of potash (K_2O) at planting time and 80 to 125 pounds of additional nitrogen (N) as a topdressing. The density of the stand is 12,000 to 18,000 plants per acre.

Tobacco receives 50 to 60 pounds of nitrogen (N), 100 to 120 pounds of phosphoric acid (P_2O_5), and 150 to 180 pounds of potash (K_2O). The stand contains 7,000 to 8,000 plants per acre. In addition, the farm operator has a program for controlling insects and disease.

Cotton receives 40 to 50 pounds of nitrogen (N), 80 to 100 pounds of phosphoric acid (P_2O_5), and 120 to 150 pounds of potash (K_2O) at planting time and 70 to 90 pounds of additional nitrogen (N) as topdressing. The density of the stand is 45,000 to 50,000 plants per acre. In addition, the farm operator has a program for controlling insects.

Small grain receives 25 pounds of nitrogen (N), 70 pounds of phosphoric acid (P_2O_5), and 90 pounds of potash (K_2O) at planting time and 75 pounds of additional nitrogen (N) as a topdressing.

Coastal bermudagrass receives 25 to 35 pounds of nitrogen (N), 50 to 75 pounds of phosphoric acid (P_2O_5), and 75 to 90 pounds of potash (K_2O) early in spring and, later, 100 and 120 pounds of additional nitrogen (N) as topdressing. In addition, the farm operator has a program for controlling insects.

Bahiagrass receives 25 to 35 pounds of nitrogen (N), 50 to 70 pounds of phosphoric acid (P_2O_5), and 90 to 120 pounds of potash (K_2O) early in spring and 100 to 150 pounds of additional nitrogen (N) as topdressing. In addition, the farm operator has a program for controlling insects.

Use of the Soils for Woodland [3]

This section contains information about the relationships between soils and trees in Appling and Jeff Davis Counties. It is useful to owners and operators of wood-

[3] W. P. THOMPSON, forester, Soil Conservation Service, assisted in preparing this section.

land in developing and carrying out plans for establishing and harvesting forest resources.

Originally, virgin forest covered about 95 percent of the total land area in Appling and Jeff Davis Counties. Presently, about 70 percent of the total land area is in forest. The principal commercial tree species on the better drained ridges and slight ridges are slash pine, loblolly pine, longleaf pine, red oak, and water oak. In the depressions, drainageways, bays, and swamps, the main commercial tree species are pondcypress, blackgum, sweetgum, water oak, willow oak, sycamore, red maple, and elm.

Both slash and longleaf pines are important to the naval stores industry as sources of turpentine and resin. After the extraction of crude gum, the trees are still marketable for other forest products.

Woodland suitability groups

The soils of Appling and Jeff Davis Counties have been placed in woodland suitability groups to assist landowners in planning the use of their soils and the management of their woodland. The groupings simplify the presentation of information. A woodland suitability group consists of soils that have comparable potential productivity and comparable limitations, produce similar wood crops, and require similar management practices.

Woodland suitability groups are identified by symbols. Each group symbol consists of three elements. The first element is an Arabic numeral that indicates the relative potential productivity of the soils in the group for growing wood crops. It expresses the site quality based on the site index of one or more important forest types or species. The numeral 1 indicates very high potential productivity; the numeral 2, high; the numeral 3, moderately high; the numeral 4, moderate; and the numeral 5, low.

The second element of the symbol is a lowercase letter that indicates the soil-related or physiographic characteristics that are the primary cause of hazards, limitations, or restrictions of the soils for woodland use or management. If wetness is the main limiting factor, the letter *w* is the second element. The letter *c* means that limitations are the result of the kind or amount of clay in the upper part of the profile. The letter *s* indicates excessive sandy material in the profile. Soils that have few or no limitations that affect their use as woodland are designated by the letter *o*.

Some soils have more than one limiting characteristic. For such soils, priority in assigning the second element of the symbol was given in the order that the characteristics are listed in the preceding paragraph.

The third element in the woodland suitability group symbol is an Arabic numeral that indicates the degree of hazards or limitations and the general suitability of the soils for certain kinds of trees. The numerals 1, 2, and 3 mean that the soils are better suited to needleleaf trees than to other kinds of trees. In addition, the numeral 1 means that the soils have no significant limitations for management; the numeral 2, that they have one or more moderate limitations; and the numeral 3, that they have one or more severe limitations. The numerals 7, 8, and 9 designate soils that are suited to both needleleaf and broadleaf trees. In addition, the numeral 7 indicates soils that have no significant limitations for management; the numeral 8, soils that have one or more moderate limitations; and the numeral 9, soils that have one or more severe limitations.

The woodland suitability group to which each mapping unit is assigned is given in the "Guide to Mapping Units" at the end of this survey and at the end of the description of the particular mapping unit in the section "Descriptions of the Soils."

Table 3 gives a brief description of each woodland suitability group in Appling and Jeff Davis Counties. It also lists the potential productivity, tree species suitable for planting, and hazards and limitations that affect management. The information in table 3 is based on pertinent research, measurements by foresters and soil scientists, and the experience of forest land managers. Much of the soil-tree site data was obtained in a cooperative study conducted by the U.S. Forest Service and the Soil Conservation Service.

Potential productivity is expressed as site index, the height in feet of the dominant and codominant trees in a stand at a stated age. For cottonwood the height is for trees at age 30; for sycamore, for trees at age 35; and for all other species, for trees at age 50. For practical application, site indexes for trees listed in table 3 have been rounded off to the nearest unit of 10. Trees for which a site index is shown in table 3 are also the trees that should be favored in existing woodland.

Species suitable for planting are the principal commercial tree species. The selection of preferred species is based on their growth rates and on the quality, value, and general marketability of the products obtained from them.

Important soil-related hazards and limitations that affect woodland use and management are listed in the last column of table 3. These are equipment limitations and seedling mortality. They are rated slight, moderate, or severe for each woodland suitability group.

Ratings for equipment limitations apply to mechanical equipment that is normally used for woodland operations. The dominant factors that limit the use of equipment are wetness of the soil, rough terrain, unfavorable texture, and obstacles such as rocks. Slope is not a limiting factor in Appling and Jeff Davis Counties. A rating of *slight* means that there are no particular limitations to the use of equipment. A rating of *moderate* indicates that not all types of equipment can be used; that there are periods of 3 months or less when equipment cannot be used because of wetness; or that the soils are unstable. A rating of *severe* indicates that the use of some kinds of equipment may be limited and special equipment may be needed; that the soil is wet for periods of more than 3 months; or that soil texture limits the use of equipment.

Seedling mortality refers to the expected degree of mortality of naturally occurring or planted tree seedlings as influenced by the kinds of soil when plant competition is not a factor. The rating is *slight* where seedling survival ordinarily exceeds 75 percent. Natural regeneration is suitable or an original planting may be expected to produce a satisfactory stand. The rating is *moderate* where seedling survival is between 50 and 75 percent. Natural regeneration cannot always be relied upon for adequate and immediate restocking, and planting may be a desirable alternative. The rating is *severe* where the seedling survival is less than 50 percent and adequate

TABLE 3.—*Woodland groups and factors in management*

Woodland suitability group and map symbols	Potential productivity		Species suitable for planting	Hazards and limitations that affect management
	Tree species in existing woodland	Site index [1]		
1w9 Excessively wet soils that are loamy throughout; very high potential productivity; suited to southern pines or hardwoods. Johnston part of Jd.	Loblolly pine Sweetgum Water oak Yellow-poplar Water tupelo Green ash	100 110 100 -------- -------- --------	Loblolly pine, slash pine, sweetgum, water tupelo.	Equipment limitations are severe; seedling mortality is moderate to severe.
2o1 Soils that have a sandy surface layer and a mainly loamy subsoil; high potential productivity; suited to southern pines. CnB, CnC, CqB, CqC, NhA, NhB, TqA, TqB.	Loblolly pine Longleaf pine Slash pine	90 70 90	Slash pine, loblolly pine, longleaf pine.	No serious management concerns.
2o7 Soils that have a sandy surface layer and a loamy subsoil; high potential productivity; suited to southern pines or hardwoods. CX, Ij	Loblolly pine Longleaf pine Slash pine Sweetgum Red oak White oak	90 70 90 90 -------- --------	Slash pine, loblolly pine, yellow-poplar, sweetgum.	No serious management concerns.
2w2 Seasonally wet soils that have a loamy surface layer and loamy and clayey layers in the subsoil; high productivity; suited to southern pines. Jc.	Loblolly pine Slash pine Longleaf pine	90 90 70	Loblolly pine, slash pine	Equipment limitations are moderate; seedling mortality is slight to moderate.
2w3 Excessively wet soils that have a sandy to loamy surface layer and a loamy subsoil; high potential productivity; suited to southern pines. Pl, Rains part of Jd.	Slash pine Loblolly pine Sweetgum Blackgum	90 90 80 80	Loblolly pine, slash pine	Equipment limitations and seedling mortality are severe.
2w8 Soils that have a sandy to loamy surface layer and a loamy to clayey subsoil; high potential productivity; suited to southern pines and hardwoods. DvB, DvD, DwB, DwC, Hi, WW.	Loblolly pine Slash pine Longleaf pine Sweetgum Water oak	90 90 70 90 80	Slash pine, loblolly pine, sweetgum, sycamore, yellow-poplar.	Equipment limitations are moderate; seedling mortality is slight to moderate.
2w9 Excessively wet soils that have a loamy surface layer and a loamy to clayey subsoil; high potential productivity; suited to southern pines and hardwoods. Bf, Cv, Sv.	Loblolly pine Slash pine Longleaf pine Sweetgum Water oak Sycamore Water tupelo	90 90 70 90 90 -------- --------	Loblolly pine, slash pine, sycamore, sweetgum.	Equipment limitations and seedling mortality are severe.
3s2 Soils that have thick sandy layers over a loamy to clayey subsoil; moderately high potential productivity; suited to southern pines. FsB, TpB, TWD, WvC.	Loblolly pine Slash pine Longleaf pine	80 80 70	Slash pine, loblolly pine, longleaf pine.	Equipment limitations and seedling mortality are moderate.
3c2 Soils that have a sandy surface layer and a clayey subsoil; moderately high potential productivity; suited to southern pines. ShD2.	Slash pine Loblolly pine Longleaf pine	80 80 70	Slash pine, loblolly pine	Equipment limitations and seedling mortality are moderate.
3w2 Seasonally wet soils that have thick sandy layers over loamy underlying layers; moderately high potential productivity; suited to southern pines. Ad, LL, Ls, Mn, Oa.	Loblolly pine Slash pine Longleaf pine	80 80 70	Slash pine, loblolly pine	Equipment limitations and seedling mortality are moderate.
5s3 Droughty soils that are sandy throughout; low potential productivity; suited to southern pines. KdC.	Slash pine Longleaf pine	60 60	Sand pine, slash pine, longleaf pine.	Equipment limitations are moderate; seedling mortality is severe.

[1] Dashes indicate that valid site index data are not available at this time.

restocking is not expected without special management. Superior planting techniques, superior planting stock, and replanting may be required to assure adequate stands.

Use of the Soils for Wildlife[4]

Successful management of wildlife requires, among other things, that food, cover, and water be available in a suitable combination. The lack of any one of these requirements or an unfavorable balance among them may severely limit the wildlife population.

Most wildlife habitats are managed by planting suitable vegetation and by manipulating existing vegetation to increase or improve the desired plants. In addition, water areas can be created, or natural ones can be improved. Information about the soils is a valuable tool in creating, improving, or maintaining a suitable habitat for wildlife.

Soil interpretations for wildlife habitat serve a variety of purposes. They aid in selecting the more suitable sites for various kinds of habitat, they indicate the intensity of management needed to achieve satisfactory results, and they show generally why it may not be feasible to manage a particular area for a given kind of wildlife. Soil interpretations are also helpful in the broad-scale planning of wildlife management areas, parks, and nature areas and in the acquiring of land to be used for wildlife.

Table 4 shows the suitability of each soil in Appling and Jeff Davis Counties for seven elements of wildlife habitat and for three types of wildlife. Ratings are based on limitations imposed by the characteristics or behavior of the soils. The size, shape, and location of mapped areas of a soil do not affect the rating, nor does the position of the soil in relation to other kinds of soil. Certain factors that influence habitat, such as elevation and aspect, must be appraised at the site.

The numerical ratings of 1 to 4 used in table 4 indicate the degree of suitability of the soil for a given habitat element.

A rating of 1 means well suited. Soil limitations are negligible. Generally, the intensity of management required for the creation, improvement, or maintenance of the habitat is low, and satisfactory results can be expected.

A rating of 2 means suited. Soil limitations are moderate. Fairly frequent attention and a moderate intensity of effort are required to achieve satisfactory results.

A rating of 3 means poorly suited. Soil limitations are severe. The creation, improvement, or maintenance of the designated habitat element is difficult, may be expensive, and requires intense effort to attain satisfactory results. For short-term use, however, soils rated as poorly suited may provide easy establishment of temporary habitat elements.

A rating of 4 means unsuited. Soil limitations are so extreme that it is highly impractical or impossible to create, improve, or maintain a suitable habitat.

The seven elements of wildlife habitat for which the soils are rated in table 4 are defined in the following paragraphs.

Grain and seed crops are domestic grains or seed-producing annuals planted to produce food for wildlife. Examples are corn, sorghum, wheat, oats, millet, soybeans, and proso.

Grasses and legumes are domestic perennial grasses and herbaceous legumes that are established by planting to furnish food and cover for wildlife. Examples are fescue, bromegrass, lovegrass, orchardgrass, reed canarygrass, panicgrass, bahiagrass, white clover, trefoil, alfalfa, annual lespedeza, perennial lespedeza, and shrub lespedeza.

Wild herbaceous upland plants are native or introduced perennial grasses and forbs (weeds) that provide food and cover principally for upland forms of wildlife. They are established mainly through natural processes. Examples are bluestem, wild ryegrass, oatgrass, pokeweed, strawberry, lespedeza, beggarweed, wild beans, nightshade, goldenrod, dandelion, cheat, poorjoe, and ragweed.

Hardwood woody plants are nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, catkins, twigs, or foliage (browse) used extensively as food by wildlife. These plants commonly are established through natural processes, but they also may be planted. Examples are oak, beech, cherry, hawthorn, dogwood, viburnum, maple, birch, poplar, grapes, honeysuckle, blueberry, briers, greenbriers, autumn-olive, and multiflora rose.

Coniferous woody plants are cone-bearing trees and shrubs that are important to wildlife mainly as cover but also may furnish food in the form of browse, seeds, or fruitlike cones. These plants commonly are established through natural processes, but they also may be planted. Examples are pine and redcedar.

Coniferous trees and shrubs that grow slowly and delay closing the canopy provide cover and food for a larger number and a greater variety of wildlife than coniferous plants that grow more rapidly. Soil properties, therefore, that promote rapid growth and canopy closure are considered limitations. In addition, these properties are considered limitations for conifers because they favor the quick establishment and growth of hardwoods. Thus, there is competition between the two kinds of plants, and frequent and intensive management is needed for the creation, improvement, or maintenance of a satisfactory coniferous habitat.

Wetland food and cover plants are annual and perennial, wild herbaceous plants on moist to wet sites, excluding submerged or floating aquatics, that produce food and cover for wetland forms of wildlife. Examples are smartweed, wild millet, bulrush, spike-sedge, rushes, sedges, burreeds, wildrice, rice cutgrass, mannagrass, and cattails.

Shallow water developments are impoundments or excavations for the control of water, generally not more than 6 feet in depth. Examples are low dikes and levees, shallow dugouts, level ditches, and water-level control devices in marshy drainageways or channels.

The three kinds of wildlife shown in table 4 are defined in the following paragraphs.

Openland wildlife are quail, dove, cottontail rabbit, fox, meadowlark, field sparrow, and other birds and

[4] PAUL D. SCHUMACHER, biologist, Soil Conservation Service, assisted in writing this section.

TABLE 4.—*Suitability of the soils for elements of wildlife habitat and kinds of wildlife*

[A rating of 1 means well suited; 2 means suited; 3 means poorly suited; and 4 means unsuited. See text for further explanation of ratings]

Soil series and map symbols	Elements of wildlife habitat							Kinds of wildlife		
	Grain and seed crops	Grasses and legumes	Wild herbaceous upland plants	Hardwood woody plants	Coniferous woody plants	Wetland food and cover plants	Shallow water developments	Openland	Woodland	Wetland
Albany: Ad	2	2	2	2	2	4	3	2	2	4
Bayboro: Bf	4	3	4	2	3	2	1	4	2	1
Cahaba: CX	1	1	2	1	1	4	4	1	1	4
Carnegie:										
CnB	1	1	1	2	2	4	4	1	2	4
CnC	2	1	1	2	2	4	4	1	2	4
Cowarts:										
CqB	1	1	1	2	2	4	4	1	2	4
CqC	2	1	1	2	2	4	4	1	2	4
Coxville: Cv	3	2	3	2	2	2	1	3	2	2
Dunbar:										
DvB	2	1	1	1	2	4	4	1	1	4
DvD	3	1	1	1	2	4	4	2	1	4
Duplin:										
DwB	1	1	1	1	2	4	4	1	1	4
DwC	2	1	1	1	2	4	4	1	1	4
Fuquay: FsB	2	1	1	2	2	4	4	1	2	4
Hazlehurst: Hi	2	1	1	1	1	3	3	1	1	3
Irvington: Ij	1	1	1	1	3	4	3	1	2	4
Johns: Jc	2	1	1	2	3	3	4	1	2	4
Johnston and Rains: Jd	4	3	4	2	4	1	2	4	3	2
Kershaw: KdC	4	3	3	3	3	4	4	3	3	4
Leefield: LL, Ls	2	1	1	2	2	3	3	1	2	3
Mascotte: Mn	3	3	2	3	2	3	3	3	2	3
Norfolk: NhA, NhB	1	1	1	1	1	4	4	1	1	4
Olustee: Oa	2	2	2	2	2	4	3	2	2	4
Pelham: Pl	3	2	2	2	2	2	2	2	2	2
Sunsweet: ShD2	3	2	3	3	2	4	4	3	3	4
Surrency: Sv	4	3	3	2	3	2	1	3	2	2
Tifton: TqA, TqB	1	1	1	1	1	4	4	1	1	4
Troup: TpB	3	2	3	3	2	4	4	3	2	4
Troup-Wicksburg: TWD	3	2	2	3	2	4	4	2	2	4
Wahee and Coxville: WW	3	2	3	1	3	2	1	3	2	2
Wicksburg: WvC	3	2	2	3	2	4	4	2	2	4

mammals that normally live on cropland, pasture, meadow, lawns, and in other openland areas where grasses, herbs, and shrubby plants grow.

Woodland wildlife are woodcock, thrush, vireo, squirrel, deer, raccoon, wild turkey, and other birds and mammals that normally live in wooded areas where hardwood trees and shrubs and coniferous trees grow.

Wetland wildlife are duck, geese, rail, heron, shore birds, mink, and other birds and mammals that normally live in marshes, swamps, and other wet areas.

Use of the Soils for Engineering [5]

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Some soil properties are of special importance in engineering because they affect the construction and maintenance of roads, airports, pipelines, building foundations, drainage systems, water storage facilities, erosion control structures, and sewage disposal systems. Among these soil properties are permeability to water, shear strength, compaction characteristics, soil drainage, shrink-swell potential, grain size, plasticity, and reaction. Also important are topography and the depth to the water table and to bedrock.

Information concerning these and related soil properties are furnished in tables 5, 6, and 7. The estimates and interpretations of soil properties in these tables can be used in:

1. Planning and designing agricultural drainage systems, farm ponds, irrigation systems, diversion terraces, and other structures for controlling water and conserving soil.
2. Making soil studies in selecting potential locations for highways, airports, pipelines, and underground cables.
3. Locating probable sources of topsoil or other soil materials for use as construction material.
4. Selecting potential industrial, commercial, residential, and recreational areas.
5. Correlating performance of structures already built with properties of the kinds of soil on which they are built for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predicting the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Developing preliminary estimates pertinent to construction in a particular area.

This information, however, does not eliminate the need for further investigations at sites selected for engineering works, especially works that involve heavy loads or that require excavations to depths greater than those shown in the tables. Also, inspection of sites, especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for engineering. Even in these situations the soil survey is useful for planning more detailed investigations and for suggesting the kinds of problems that may be expected.

Some of the terms used in this soil survey have special meanings to soil scientists that are not known to all engineers. The Glossary defines many of these terms commonly used in soil science.

Engineering classification systems

The two systems most commonly used in classifying samples of soils for engineering are the AASHO system adopted by the American Association of State Highway Officials, and the Unified system used by the SCS engineers, Department of Defense, and others.

The AASHO system is used to classify soils according to those properties that affect use in highway construction and maintenance (*2*). In this system, a soil is placed in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme are clayey soils that have low strength when wet. The best soils for subgrade are therefore classified as A-1, the next best A-2, and so on to class A-7, the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A-1, A-2, and A-7 groups are divided as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. If soil material is near a classification boundary, it is given a symbol showing both classes; for example, A-2 or A-4. Within each group, the relative engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 for the poorest. Table 5 shows the AASHO classification, with group index numbers in parentheses, for tested soils; for example, A-2-6(1). Table 6 gives the estimated classification, without group index numbers, for all soils mapped in the survey area.

The Unified system was developed by the U.S. Department of Defense (*10*). In this system soils are classified according to particle-size distribution, plasticity, liquid limit, and organic matter and are grouped according to their performance as construction material. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example, SM-SC.

Engineering test data

To help evaluate the soils in Appling and Jeff Davis Counties for engineering purposes, eight samples of soils in the Fuquay, Leefield, and Olustee series were tested according to standard procedures. The results are given in table 5. Each soil was sampled in more than one location so that a range in characteristics could be shown. Nevertheless, the data probably do not show the maximum variation in the horizons of each soil series. The samples were tested for moisture-density relationships,

[5] JAMES E. PAYNE, agricultural engineer, Soil Conservation Service, helped prepare this section.

volume change, grain-size distribution, liquid limit, and plasticity index.

Moisture-density data are obtained by compacting soil material several times at successively higher moisture content. Assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, the density decreases with increase in moisture content. The highest dry density obtained in the compaction test is termed "maximum dry density." Moisture-density data are important in earthwork because, as a rule, optimum stability is obtained if the soil is compacted to about the maximum dry density when it is at approximately the optimum moisture content.

To get the percentages of shrinkage and swelling recorded under the heading "Volume change," samples were prepared at optimum moisture content and then subjected to drying and wetting. The sum of these two values is the "Total volume change."

The relative proportions of the different size particles in the soil samples were determined through mechanical analysis made by a combination of the sieve and hydrometer methods.

The test that determines the plastic limit and liquid limit measures the effect of water on the consistence of the soil material. As the moisture content of a clayey soil increases from a dry state, the material changes from a semisolid to a plastic state. As the moisture content is further increased, the material changes from a plastic to a liquid state. The plastic limit is the moisture content at which the soil material changes from a semisolid to a plastic state. The liquid limit is the moisture content at which the material passes from a plastic to a liquid state. The plasticity index is the numerical difference between liquid limit and plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Estimated soil properties significant to engineering

Table 6 gives, for the soils of each series, estimates of the soil properties significant to engineering. These estimates are based on test data, on field observations, and on past experience in engineering. The estimates are mainly for typical soil profiles; consequently, some variation from them must be expected.

The depth to the seasonal high water table refers to the approximate distance, in inches, from the surface down to ground water during the wettest season of the year. The depth to bedrock is not given, because most soils in the survey area are deep enough that bedrock generally does not affect their use; however, sandstone is at a depth of about 48 inches in the Dunbar soils.

Soil texture is described in table 6 in the standard terms used by the U.S. Department of Agriculture. These terms take into account relative percentages of sand, silt, and clay in soil material that is less than 2 millimeters in diameter. "Loam," for example, is soil material that contains 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the soil contains gravel or other particles coarser than sand, an appropriate modifier is added, as for example, "gravelly loamy sand." "Sand," "silt," "clay," and some of the other terms used in USDA textural classification are defined in the Glossary of this soil survey.

Permeability refers to the quality that enables a soil horizon to transmit water or air. The estimates of permeability are based on study of texture, structure, and consistence and on field observations.

Available water capacity is the ability of soils to hold water for use by most plants. It is commonly defined as the difference between the amount of water in the soil at field capacity and the amount at the wilting point of most crop plants.

Reaction is the degree of acidity or alkalinity of a soil, expressed in pH values. The pH value and terms used to describe soil reaction are explained in the Glossary.

Shrink-swell potential is an indication of the volume change to be expected with change in moisture content; that is, the extent to which the soil shrinks as it dries out or swells when it gets wet. It is estimated primarily on the basis of the amount and type of clay in the soil. In general, soils classified as CH are high or moderate to high in shrink-swell potential; sands and those soil materials having small amounts of nonplastic or slightly plastic fines are low; and silty clays and sandy clays that are nonplastic or slightly plastic are moderate.

Engineering interpretations of the soils

In table 7, suitability of the soils as a source of topsoil and road fill is rated and the soil features that significantly affect highway location and soil and water conservation engineering are listed. These features generally are apparent only after field investigation.

A rating of good, fair, or poor indicates the suitability of the soil as a source of topsoil and road fill. Topsoil is a soil material for top-dressing lawns, gardens, roadbanks, earth structures, and the like that require a plant cover for protection. The suitability of a soil as a source of topsoil is affected mainly by natural fertility, texture, and the ease with which the soil can be worked or spread, as in preparing a seedbed. Other desirable properties are that it responds well to applications of fertilizer, is free of substances toxic to plants, and is free of stone fragments. The damage to the area from which the topsoil is removed is also considered in the ratings.

Road fill is the soil material used in embankments for roads. In rating soils as a source of material for road fill, the features generally considered are plasticity, water content, compaction characteristics, and erodibility.

Highway location is affected by a seasonal high water table, susceptibility to flooding, seepage, plasticity, erodibility, and stability. A seasonal high water table and susceptibility to flooding are the most common adverse features in Appling and Jeff Davis Counties.

In selecting the reservoir area for a farm pond, the subsoil features are important, particularly such features as permeability and seepage. An onsite investigation of underground drainage should be made before a farm pond is constructed.

Some of the features to be considered in selecting soil material for the embankments of a small reservoir are strength and stability, compaction characteristics, and permeability. If core walls are used, stability is especially important. The core should be constructed out of soil material that has moderate to slow permeability and good compaction characteristics. Soil material that has a high shrink-swell potential is not desirable for use in either the core or the side slopes.

TABLE 5.—*Engineering*

[Tests performed by the State Highway Department of Georgia in cooperation with the U.S. Department of Commerce,

Soil name and location	Parent material	SCS report No.	Depth from surface	Moisture-density [1]		Volume change [2]		
				Maximum dry density	Optimum moisture	Shrinkage	Swell	Total volume change
			Inches	*Lb. per cu. ft.*	*Percent*	*Percent*	*Percent*	*Percent*
Fuquay loamy sand:								
Jeff Davis County: 1 mile north of Appling County line, 5 miles northeast of Graham, and 75 yards east of Brewer residence. (Modal)	Unconsolidated marine sands.	80-6-1	16-36	117	8	0.7	2.0	2.7
		80-6-2	36-60	115	13	6.1	1.9	8.0
Jeff Davis County: 2 miles northeast of Graham and 30 yards north of curve on county road. (Less clay in the 32- to 50-inch layer than modal)	Unconsolidated marine sands.	80-4-1	16-32	115	10	1.6	1.8	3.4
		80-4-2	32-50	119	10	1.6	4.8	6.4
Jeff Davis County: 1.25 miles southwest of Altamaha School, 200 yards north of county road, and 200 yards northwest of Bell residence. (Coarser textured in surface layer than modal)	Unconsolidated marine sands.	80-5-1	24-38	108	9	0	0	0
		80-5-2	44-54	117	13	2.9	4.8	7.7
Leefield loamy sand:								
Jeff Davis County: 2 miles west of Hazlehurst and 0.25 mile south of house on Collins farm. (Modal)	Marine deposits.	80-1-1	8-17	118	9	.7	3.9	4.6
		80-1-2	26-38	122	10	5.2	.3	5.5
		80-1-3	38-50	121	11	7.2	3.6	10.8
Appling County: 5 miles north of Baxley and 200 yards northwest of Sellars residence. (Sandy upper part of the profile is thinner than modal)	Marine deposits.	1-4-1	8-17	120	8	1.2	.6	1.8
		1-4-2	24-31	122	12	3.0	3.3	6.3
		1-4-3	34-53	118	12	1.6	1.9	3.5
Appling County: 4 miles south of Baxley, 0.8 mile north of State Highway No. 15, and 20 yards west of county road. (More fines in the 32- to 42-inch layer than modal)	Marine deposits.	1-6-1	6-15	115	10	0	0	0
		1-6-2	19-26	118	12	4.3	0	4.3
		1-6-3	32-42	109	16	9.3	2.7	12.0
Olustee sand:								
Appling County: 1.5 miles north of State Highway No. 121, 50 yards east of State Highway No. 15, and 10 yards north of county road. (Modal)	Marine sands.	1-7-1	0-6	106	12	0	4.3	4.3
		1-7-2	6-12	115	11	0	3.0	3.0
		1-7-3	15-40	118	8	1.8	3.0	4.8
Appling County: 1.5 miles east of Pine Grove on South Road cut. (More clay in the 11- to 28-inch layer than modal)	Marine sands.	1-9-1	0-4	108	13	.3	1.3	1.6
		1-9-2	6-9	114	11	0	3.6	3.6
		1-9-3	11-28	118	9	.5	0	.5

[1] Based on AASHO Designation T 99-57, methods A and C (*2*).

[2] Based on "A System of Soil Classification" by W. F. Abercrombie (*1*).

[3] Mechanical analyses according to the AASHO Designation T 88. Results by this procedure frequently may differ somewhat from results that would have been obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method, and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method, and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analyses used in this table are not suitable for use in naming textural classes for soil.

test data

Bureau of Public Roads, in accordance with standard procedures of the American Association of State Highway Officials (AASHO)]

Mechanical analysis [3]										Liquid limit	Plasticity index	Classification	
Percentage passing sieve—						Percentage smaller than—						AASHO [4]	Unified [5]
¾-in.	⅜-in.	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)	0.05 mm.	0.02 mm.	0.005 mm.	0.002 mm.				
--------	--------	100	99	76	15	13	10	8	6	[6] NP	[6] NP	A-2-4(0)	SM
--------	100	99	99	75	34	31	30	27	26	30	15	A-2-6(1)	SC
--------	--------	--------	100	86	14	12	8	8	7	NP	NP	A-2-4(0)	SM
100	99	99	99	87	23	21	19	17	15	NP	NP	A-2-4(0)	SM
--------	100	99	99	76	9	7	7	7	5	NP	NP	A-3(0)	SP-SM
--------	100	99	99	80	31	27	26	24	20	26	11	A-2-6(0)	SC
--------	--------	100	99	92	20	12	11	10	8	NP	NP	A-2-4(0)	SM
[7] 98	96	94	93	86	26	24	22	20	18	NP	NP	A-2-4(0)	SM
[8] 96	86	81	77	69	22	20	19	18	17	22	9	A-2-4(0)	SC
--------	--------	100	99	67	17	16	14	10	8	NP	NP	A-2-4(0)	SM
--------	100	99	98	69	25	23	22	20	19	18	6	A-2-4(0)	SM-SC
--------	--------	100	98	68	26	25	25	24	22	27	13	A-2-6(0)	SC
--------	--------	100	97	71	10	10	9	8	6	NP	NP	A-3	SP-SM
--------	--------	100	97	72	23	20	20	18	18	18	4	A-2-4(0)	SM-SC
--------	--------	100	99	74	30	29	29	29	28	39	19	A-2-6(2)	SC
--------	--------	--------	100	79	13	12	6	3	2	NP	NP	A-2-4(0)	SM
--------	--------	--------	100	79	14	10	6	5	4	NP	NP	A-2-4(0)	SM
--------	--------	--------	100	75	15	10	6	3	2	NP	NP	A-2-4(0)	SM
--------	--------	100	99	85	15	10	6	4	2	NP	NP	A-2-4(0)	SM
--------	--------	--------	100	81	14	12	8	5	4	NP	NP	A-2-4(0)	SM
--------	--------	--------	100	83	16	12	10	8	7	NP	NP	A-2-4(0)	SM

[4] Based on AASHO Designation: M 145-49 (*2*).

[5] Based on the Unified Soil Classification System (*10*). SCS and BPR have agreed to consider that all soils having plasticity indexes within two points of the A-line are to be given a borderline classification. Examples of borderline classifications obtained by this use are SP-SM and SM-SC.

[6] Nonplastic.

[7] 100 percent passes 1-inch sieve.

[8] 100 percent passes 1½-inch sieve; 98 percent passes 1-inch sieve.

TABLE 6.—*Estimated soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in referring to other series that appear in the first

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Dominant USDA texture
		Inches	
Albany: Ad	15 to 30 inches for 1 to 2 months or more each year.	0–44	Sand and loamy sand
		44–65	Sandy loam and sandy clay loam
Bayboro: Bf	Less than 15 inches for 2 to 6 months each year.	0–13	Loam
		13–55	Clay
Cahaba: CX	More than 48 inches.	0–12	Loamy sand and sandy loam
		12–36	Sandy clay loam
		36–42	Sandy loam
		42–60	Coarse sand
Carnegie: CnB, CnC	More than 48 inches.	0–5	Loamy sand
		5–22	Sandy clay loam
		22–60	Sandy clay loam
Cowarts: CqB, CqC	More than 48 inches.	0–7	Loamy sand
		7–22	Sandy clay loam and sandy loam
		22–54	Sandy clay loam
		54–60	Sandy clay loam
Coxville: Cv	Less than 15 inches for more than 6 months each year.	0–5	Loam
		5–60	Silty clay
Dunbar: DvB, DvD	30 to 60 inches for 1 to 2 months each year.	0–8	Loamy sand and sandy loam
		8–44	Clay and sandy clay
		44–48	Sandy clay loam and clay
		48	Sandstone.
Duplin: DwB, DwC	About 24 to 36 inches for 1 to 2 months each year.	0–12	Loamy sand
		12–60	Clay and sandy clay
Fuquay: FsB	More than 60 inches.	0–22	Loamy sand
		22–54	Sandy loam and sandy clay loam
		54–63	Sandy clay loam
Hazlehurst: Hi	15 to 30 inches for 2 to 6 months each year.	0–13	Loamy sand
		13–24	Sandy clay loam
		24–63	Sandy clay loam
Irvington: Ij	15 to 30 inches for 1 to 2 months or more each year.	0–9	Loamy sand
		9–16	Sandy loam
		16–26	Sandy clay loam
		26–40	Sandy clay loam
		40–60	Hardened plinthite coated with sandy clay loam.
Johns: Jc	15 to 30 inches for 1 to 2 months each year.	0–13	Sandy loam
		13–24	Sandy clay loam
		24–50	Clay and sandy clay loam
		50–63	Sandy loam

See footnote at end of table.

significant to engineering

such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for column of this table. The symbol> means more than]

Classification		Percentage passing sieve [1]—				Permea-bility	Available water capacity	Reac-tion	Shrink-swell potential
Unified	AASHO	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)				
						Inches per hour	*Inches per inch of soil*	*pH*	
SP, SM, or SP-SM	A-2	100	100	75-85	5-15	6. 0-10. 0	0. 04-0. 06	4. 5-5. 5	Low.
SM or SC	A-4, A-2	95-100	95-100	70-80	30-40	0. 6-2. 0	0. 12-0. 14	4. 5-5. 5	Low.
ML	A-4	100	100	80-90	50-65	0. 6-2. 0	0. 15-0. 18	4. 5-5. 0	Moderate.
CL or MH	A-6	100	100	85-95	60-75	0. 06-0. 2	0. 13-0. 15	4. 5-5. 0	Moderate to high.
SM	A-2	100	100	60-75	15-30	2. 0-6. 0	0. 06-0. 08	4. 5-5. 5	Low.
SC or SM	A-4, A-6	100	100	60-75	36-45	0. 6-2. 0	0. 12-0. 14	4. 5-5. 5	Low.
SM	A-2	95-100	95-100	55-70	25-35	2. 0-6. 0	0. 10-0. 12	4. 5-5. 5	Low.
SP	A-3	80-100	80-100	50-60	2-4	6. 0-20. 0	0. 03-0. 05	4. 5-5. 5	Low.
SM	A-2	75-85	75-85	60-80	15-25	2. 0-6. 0	0. 06-0. 08	4. 5-5. 5	Low.
SC or CL	A-6	80-95	80-95	50-70	40-55	0. 6-2. 0	0. 12-0. 15	4. 5-5. 5	Moderate.
SC, SM, or CL	A-6, A-7	80-95	85-95	50-80	40-60	0. 06-0. 2	0. 10-0. 13	4. 5-5. 5	Moderate.
SM	A-2	85-95	85-95	60-75	15-25	2. 0-6. 0	0. 06-0. 08	4. 5-5. 5	Low.
SC	A-2, A-4	90-100	90-100	70-80	30-43	0. 6-2. 0	0. 11-0. 13	4. 5-5. 5	Low.
SC or SM-SC	A-2, A-6	90-100	95-100	70-80	30-43	0. 06-0. 2	0. 09-0. 11	4. 5-5. 5	Low.
SC	A-2, A-6	100	85-100	70-85	30-45	0. 6-2. 0	0. 10-0. 13	4. 5-5. 5	Low.
ML or SM	A-4	100	100	80-90	36-55	0. 6-2. 0	0. 14-0. 16	4. 5-5. 0	Low.
CH or MH	A-7	100	100	80-95	60-75	0. 2-0. 6	0. 13-0. 16	4. 5-5. 0	Moderate to high.
SM	A-2	90-100	90-100	60-85	15-20	2. 0-6. 0	0. 09-0. 12	4. 5-5. 0	Low.
MH or CL	A-7	100	100	80-95	70-85	0. 06-0. 2	0. 12-0. 14	4. 5-5. 0	Moderate.
CL	A-7	100	100	80-90	50-60	0. 2-0. 6	0. 13-0. 15	4. 5-5. 0	Moderate.
SM	A-2	90-100	90-100	60-80	15-20	2. 0-6. 0	0. 06-0. 08	4. 5-5. 0	Low.
CL	A-7	100	100	70-85	50-70	0. 06-0. 2	0. 12-0. 14	4. 5-5. 0	Moderate.
SM or SP-SM	A-2, A-3	85-100	85-100	70-88	8-15	2. 0-6. 0	0. 06-0. 08	4. 5-5. 0	Low.
SM or SC	A-2	85-100	85-100	70-85	20-35	0. 6-2. 0	0. 11-0. 13	4. 5-5. 0	Low.
SM or SC	A-2	90-100	90-100	70-85	20-35	0. 06-0. 2	0. 12-0. 14	4. 5-5. 0	Low.
SM or SP-SM	A-2	90-100	90-100	60-75	10-25	6. 0-10. 0	0. 06-0. 08	4. 5-5. 0	Low.
SM or SC	A-2, A-4	90-100	90-100	60-80	30-45	0. 6-2. 0	0. 12-0. 14	4. 5-5. 0	Low.
SC	A-2, A-6	70-90	70-90	60-85	30-50	0. 06-0. 2	0. 10-0. 12	4. 5-5. 0	Low.
SM or SP-SM	A-2	85-95	85-95	60-80	10-20	2. 0-6. 0	0. 07-0. 10	4. 5-5. 5	Low.
SM	A-2	90-95	90-95	70-85	20-35	2. 0-6. 0	0. 12-0. 14	4. 5-5. 5	Low.
SM or SC	A-2, A-4	90-100	85-100	70-90	33-45	0. 2-6. 0	0. 12-0. 14	4. 5-5. 5	Low.
SC	A-2, A-6	85-95	85-95	70-90	33-50	0. 2-0. 6	0. 09-0. 11	4. 5-5. 5	Low.
SM	A-2	100	100	60-80	20-35	2. 0-6. 0	0. 10-0. 12	4. 5-5. 5	Low.
SM	A-2, A-4	100	100	70-80	30-40	0. 6-2. 0	0. 11-0. 13	4. 5-5. 5	Low.
SC or CL	A-6, A-7	100	100	70-85	36-60	0. 6-2. 0	0. 13-0. 15	4. 5-5. 5	Moderate.
SM	A-2	100	100	60-80	25-35	0. 6-2. 0	0. 11-0. 13	4. 5-5. 5	Low.

TABLE 6.—*Estimated soil properties*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Dominant USDA texture
		Inches	
*Johnston: Jd	Less than 15 inches for 6 to 12 months each year.	0–40	Fine sandy loam
For the Rains part of this unit, see the Rains series.		40–60	Fine sandy loam
Kershaw: KdC	More than 100 inches.	0–72	Sand
Leefield: LL, Ls	15 to 30 inches for 2 to 6 months each year.	0–26	Loamy sand
		26–30	Sandy loam
		30–42	Sandy clay loam
		42–63	Sandy clay loam
Mascotte: Mn	Less than 15 inches for 1 to 2 months each year.	0–12	Sand
		12–15	Sand
		15–38	Sand
		38–63	Sandy loam
Norfolk: NhA, NhB	More than 48 inches.	0–12	Loamy sand
		12–22	Sandy loam
		22–63	Sandy clay loam
Olustee: Oa	Less than 15 inches for 1 to 2 months each year.	0–28	Sand and loamy sand
		28–60	Sandy loam
Pelham: Pl	Less than 15 inches for 2 to 6 months each year.	0–26	Loamy sand
		26–42	Sandy loam
		42–60	Sandy clay loam
Rains	Less than 15 inches for 6 to 12 months each year.	0–31	Loam and sandy loam
Mapped only in an undifferentiated group with Johnston soils.		31–60	Sandy clay loam
Sunsweet: ShD2	More than 48 inches.	0–4	Sandy loam
		4–60	Clay and sandy clay
Surrency: Sv	Less than 15 inches for more than 6 months each year.	0–12	Loamy sand
		12–32	Sand
		32–65	Sandy clay loam and sandy loam
Tifton: TqA, TqB	More than 60 inches.	0–9	Loamy sand
		9–16	Sandy loam
		16–34	Sandy clay loam
		34–70	Sandy clay loam
*Troup: TpB, TWD	More than 60 inches.	0–56	Sand and loamy sand
For the Wicksburg part of TWD, see the Wicksburg series.		56–80	Sandy clay loam and sandy loam
*Wahee: WW	Less than 15 inches for 2 to 6 months each year.	0–3	Silty clay loam
For the Coxville part of this unit, see the Coxville series.		3–60	Silty clay
Wicksburg: WvC	More than 60 inches.	0–24	Gravelly coarse sand and coarse sand
		24–28	Sandy loam
		28–60	Sandy clay

[1] None of the soils contain materials coarser than 3 inches in diameter.

significant to engineering—Continued

Classification		Percentage passing sieve [1]—				Permeability	Available water capacity	Reaction	Shrink-swell potential
Unified	AASHO	No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)				
						Inches per hour	*Inches per inch of soil*	*pH*	
OL	A-4	100	100	60-70	50-60	2. 0-8. 0	0. 12-0. 15	4. 5-5. 0	Low.
SM	A-2	100	100	60-85	20-30	2. 0-8. 0	0. 10-0. 15	4. 5-5. 0	Low.
SP or SP-SM	A-3, A-2	100	100	60-90	4-12	>20. 0	0. 03-0. 05	4. 5-5. 0	Low.
SM or SP-SM	A-2	100	95-100	65-95	10-25	6. 0-10. 0	0. 05-0. 08	4. 5-5. 0	Low.
SM or SM-SC	A-2	95-100	95-100	65-95	20-30	2. 0-6. 0	0. 11-0. 13	4. 5-5. 0	Low.
SM or SC	A-2, A-6	80-100	75-100	70-95	20-50	0. 6-2. 0	0. 10-0. 13	4. 5-5. 0	Low.
SC or SM	A-2, A-6	95-100	75-100	70-95	20-50	0. 2-0. 6	0. 09-0. 11	4. 5-5. 0	Low.
SP	A-3	100	100	70-85	2-4	6. 0-10. 0	0. 06-0. 08	4. 5-5. 0	Low.
SM or SP-SM	A-2	100	100	70-85	12-18	0. 6-2. 0	0. 10-0. 12	4. 5-5. 0	Low.
SP or SP-SM	A-3	100	100	70-85	2-5	6. 0-10. 0	0. 04-0. 06	4. 5-5. 0	Low.
SM or SP-SM	A-2	100	100	70-85	12-25	0. 6-2. 0	0. 08-0. 12	4. 5-5. 0	Low.
SM or SP-SM	A-2	95-100	95-100	60-80	10-20	6. 0-8. 0	0. 06-0. 08	5. 1-5. 5	Low.
SM	A-2	85-100	95-100	60-85	20-30	2. 0-6. 0	0. 11-0. 13	5 1-5. 5	Low.
SC	A-4, A-6	95-100	95-100	60-85	36-45	0. 6-2. 0	0. 13-0. 15	5. 1-5. 5	Low.
SM, SP, or SP-SM	A-2	100	95-100	70-85	4-15	6. 0-10. 0	0. 05-0. 07	5. 1-5. 5	Low.
SM or SP-SM	A-2	100	95-100	65-85	12-20	0. 6-2. 0	0. 09-0. 11	5. 1-5. 5	Low.
SM	A-2	100	100	70-90	15-20	6. 0-8. 0	0. 06-0. 08	4. 5-5. 0	Low.
SM or SM-SC	A-2	100	100	70-90	20-30	2. 0-6. 0	0. 10-0. 12	4. 5-5. 0	Low.
SM or SC	A-2, A-6	90-100	90-100	75-95	25-40	0. 6-2. 0	0. 11-0. 13	4. 5-5. 0	Low.
ML or SM	A-2, A-4	100	100	70-90	30-55	0. 6-2. 0	0. 10-0. 13	4. 5-5. 0	Low.
SM or SC	A-6, A-2	100	100	75-95	30-45	0. 6-2. 0	0. 11-0. 13	4. 5-5. 0	Low.
SM	A-2	70-90	70-90	45-60	15-25	0. 6-2. 0	0. 09-0. 11	4. 5-5. 0	Low.
CL	A-6, A-7	80-100	80-100	85-98	60-80	0. 2-0. 6	0. 10-0. 13	4. 5-5. 0	Moderate.
SM or SP-SM	A-2	100	100	60-70	10-20	6. 0-10. 0	0. 10-0. 12	4. 0-5. 0	Low.
SM or SP-SM	A-2	100	100	70-70	5-15	6. 0-15. 0	0. 07-0. 09	4. 0-5. 0	Low.
SC	A-6	100	100	65-80	36-50	0. 6-2. 0	0. 12-0. 14	4. 0-5. 0	Low.
SM or SP-SM	A-2	80-90	80-90	45-70	12-20	6. 0-10. 0	0. 06-0. 09	4. 5-5. 5	Low.
SM	A-2	80-90	80-90	50-80	20-35	2. 0-6. 0	0. 11-0. 13	4. 5-5. 5	Low.
SC or SM-SC	A-2, A-6	90-100	90-100	65-80	30-45	0. 6-2. 0	0. 13-0. 15	4. 5-5. 5	Low.
SC	A-4, A-6, A-7	95-100	95-100	70-80	36-45	0. 6-2. 0	0. 10-0. 12	4. 5-5. 5	Low.
SM or SP-SM	A-2, A-3	100	100	70-80	5-15	6. 0-10. 0	0. 04-0. 06	4. 5-5. 0	Low.
SM or SC	A-2, A-6	95-100	95-100	80-95	30-40	0. 6-2. 0	0. 11-0. 13	4. 5-5. 0	Low.
ML	A-4, A-6	100	100	85-98	70-80	0. 2-0. 6	0. 12-0. 16	4. 5-5. 0	Low to moderate.
CL or MH	A-7	100	100	80-100	70-90	0. 06-0. 2	0. 12-0. 15	4. 5-5. 0	Moderate to high.
SP-SM or SM	A-2	75-85	75-85	50-60	5-15	>20. 0	0. 03-0. 05	4. 5-5. 0	Low.
SM	A-2, A-4	85-95	85-95	60-80	30-40	0. 6-2. 0	0. 10-0. 12	4. 5-5. 0	Low.
SC or CL	A-6, A-7	90-100	90-100	65-85	45-55	0. 06-0. 2	0. 11-0. 14	4. 5-5. 0	Moderate.

TABLE 7.—*Interpretations of engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils for referring to other series that

Soil series and map symbols	Suitability as a source of—		Soil features affecting—
	Topsoil	Road fill	Highway location
Albany: Ad	Poor: loamy sand to a depth of about 44 inches.	Fair: seasonal high water table.	Seasonal high water table
Bayboro: Bf	Poor: seasonal high water table.	Poor: seasonal high water table.	Seasonal high water table; ponding.
Cahaba: CX	Poor to a depth of 8 inches; fair to a depth of 42 inches if surface layer and upper part of subsoil are mixed.	Good	Features generally favorable
Carnegie: CnB, CnC	Poor to a depth of 5 inches; fair to a depth of 22 inches if surface layer and upper part of subsoil are mixed.	Fair: moderate shrink-swell potential in some layers of subsoil.	Moderate shrink-swell potential in some layers of subsoil.
Cowarts: CqB, CqC	Poor to a depth of 7 inches; fair to a depth of about 22 inches if surface layer and upper part of subsoil are mixed.	Good	Features generally favorable
Coxville: Cv	Poor: seasonal high water table.	Poor: seasonal high water table.	Flooding; seasonal high water table.
Dunbar: DvB, DvD	Fair if upper 8 inches is mixed	Poor: seasonal high water table; clayey subsoil.	Moderate shrink-swell potential
Duplin: DwB, DwC	Poor: loamy sand surface layer and clayey layers in subsoil.	Poor to fair: moderate shrink-swell potential.	Moderate shrink-swell potential
Fuquay: FsB	Poor: loamy sand to a depth of 22 inches.	Good	Features generally favorable
Hazlehurst: Hi	Poor to a depth of 13 inches; fair to a depth of 24 inches if surface layer and upper part of subsoil are mixed.	Fair: seasonal high water table.	Seasonal high water table
Irvington: Ij	Poor to a depth of 9 inches; fair to a depth of 26 inches if surface layer and upper part of subsoil are mixed.	Fair to good: seasonal high water table for short periods.	Seasonal high water table for short periods.
Johns: Jc	Good to a depth of 13 inches; fair to a depth of 18 inches if surface layer and upper part of subsoil are mixed.	Fair: seasonal high water table.	Seasonal high water table; flooding in some areas.
*Johnston: Jd For Rains part of this unit, see Rains series.	Poor: seasonal high water table.	Poor: seasonal high water table.	Flooding; seasonal high water table.

See footnote at end of table.

properties of the soils

in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions appear in the first column of this table]

Soil features affecting—Continued				
Farm ponds		Drainage for crops and pasture	Sprinkler irrigation	Terraces and diversions
Reservoir areas	Embankments			
Moderate permeability	Fair to poor resistance to piping.	Seasonal high water table.	Low available water capacity.[1]	Nearly level.
Seasonal high water table.	Fair to poor compaction characteristics.	Seasonal high water table; scarcity of suitable outlets.	Seasonal high water table; slow permeability.	Nearly level.
Sandy substratum	Features generally favorable.	Well drained	Features generally favorable.	Nearly level.
Features generally favorable.	Features generally favorable.	Well drained	CnB: features generally favorable.[1] CnC: slope.[1]	Plinthitic material at a depth of about 22 inches.
Features generally favorable.	Features generally favorable.	Well drained	CqB: features generally favorable. CqC: slope.	Plinthitic material at a depth of about 22 inches.
Flooding; seasonal high water table.	Moderate to high shrink-swell potential; cracks when dry.	Flooding; moderately slow permeability; scarcity of outlets.	Seasonal high water table; moderately slow permeability.	Nearly level.
Features generally favorable.	Fair to poor stability; fair to poor compaction characteristics.	Slowly permeable	Slow permeability; seasonal high water table.	Slow permeability; sandstone layer at a depth of about 48 inches.
Features generally favorable.	Fair to good stability and compaction characteristics.	Slowly permeable	Slow permeability	Slow permeability; clayey subsoil.
Highly permeable material in the upper 22 inches.	Moderate permeability when compacted; poor resistance to piping.	Well drained	Low available water capacity.[1]	Sandy to a depth of 22 inches.
Features generally favorable.	Features generally favorable.	Seasonal high water table; scarcity of outlets.	Slow permeability[1]	Nearly level.
Features generally favorable.	Features generally favorable.	Seasonal high water table; scarcity of outlets.	Features generally favorable.[1]	Nearly level.
Substratum variable; occasional flooding in some areas.	Fair to good stability and compaction characteristics.	Moderate permeability; seasonal high water table; scarcity of outlets.	Features generally favorable.	Nearly level.
Upper 40 inches contains a fairly large amount of organic matter and has moderately rapid to rapid permeability.	Upper 40 inches contains a fairly large amount of organic matter.	Flooding; seasonal high water table.	Flooding; seasonal high water table.	Nearly level.

TABLE 7.—*Interpretations of engineering*

Soil series and map symbols	Suitability as a source of—		Soil features affecting—
	Topsoil	Road fill	Highway location
Kershaw: KdC	Poor: sand to a depth of 72 inches.	Good	Loose sand hinders hauling operations.
Leefield: LL, Ls	Poor: loamy sand to a depth of about 26 inches.	Fair: seasonal high water table.	Seasonal high water table
Mascotte: Mn	Poor: seasonal high water table.	Poor: seasonal high water table.	Seasonal high water table
Norfolk: NhA, NhB	Poor to a depth of 12 inches; good to a depth of 30 inches if surface layer and upper part of subsoil are mixed.	Good	Features generally favorable
Olustee: Oa	Poor: seasonal high water table.	Poor: seasonal high water table.	Seasonal high water table
Pelham: Pl	Poor: seasonal high water table.	Poor: seasonal high water table.	Seasonal high water table
Rains. Mapped only in an undifferentiated unit with the Johnston soils.	Poor: seasonal high water table.	Poor: seasonal high water table.	Seasonal high water table
Sunsweet: ShD2	Poor: clay at a depth of 4 inches.	Fair: moderate shrink-swell potential; slope.	Moderate shrink-swell potential.
Surrency: Sv	Poor: seasonal high water table.	Poor: seasonal high water table.	Seasonal high water table.
Tifton: TqA, TqB	Poor to a depth of 9 inches; good to a depth of about 30 inches if surface layer and upper part of subosil are mixed.	Good	Features generally favorable
*Troup: TpB, TWD. For Wicksburg part of TWD, see Wicksburg series.	Poor: sand to a depth of 56 inches.	Good for TpB; fair for TWD: slope.	Features generally favorable
*Wahee: WW. For Coxville part of this unit, see Coxville series.	Poor: silty clay at a depth of about 3 inches.	Poor: moderate to high shrink-swell potential.	Flooding; moderate to high shrink-swell potential.
Wicksburg: WvC	Poor: mainly coarse sand to a depth of about 24 inches.	Good to a depth of about 28 inches; fair in the 28- to 60-inch layer: moderate shrink-swell potential.	Moderate shrink-swell potential in the 28- to 60-inch layer.

1 Water-bearing strata for irrigation pits are at depths of 10 to 20 feet in many places.

properties of the soils—Continued

Soil features affecting—Continued				
Farm ponds		Drainage for crops and pasture	Sprinkler irrigation	Terraces and diversions
Reservoir areas	Embankments			
Very rapid permeability and seepage.	Sandy material; rapid seepage rate.	Excessively drained	Low productivity; very low available water capacity.	Very rapid permeability; subject to gullying.
Moderate permeability; slow to moderate seepage.	Moderate to low permeability when compacted.	Seasonal high water table; scarcity of outlets.	Features generally favorable.[1]	Nearly level.
Moderate permeability; moderate seepage.	High to moderate permeability when compacted.	Seasonal high water table; scarcity of outlets.	Seasonal high water table; low available water capacity.[1]	Nearly level.
Moderate permeability; moderate to slow seepage.	Features generally favorable.	Well drained	Features generally favorable.	NhA: nearly level. NhB: features generally favorable.
Moderate permeability and seepage.	Moderate permeability when compacted.	Seasonal high water table; scarcity of suitable outlets.	Low available water capacity; seasonal high water table.	Nearly level.
Moderate permeability; moderate to slow seepage.	Fair to good compaction characteristics.	Seasonal high water table; scarcity of suitable outlets.	Seasonal high water table.	Nearly level.
Moderate permeability; slow seepage.	Features generally favorable.	Seasonal high water table; scarcity of suitable outlets.	Seasonal high water table.	Nearly level.
Features generally favorable.	Fair to good stability and compaction characteristics.	Well drained	Moderately slow permeability; slope.	Slope; plinthite at a shallow depth.
Moderate permeability	Sandy material in the upper 32 inches of the profile is moderately permeable after compaction.	Seasonal high water table; scarcity of suitable outlets.	Seasonal high water table.	Nearly level.
Moderate permeability; moderate to slow seepage.	Features generally favorable.	Well drained	Features generally favorable.[1]	TqA: nearly level. TqB: features generally favorable.
Highly permeable material in the upper 56 inches of the profile.	Sandy material to a depth of 56 inches; rapid seepage rate.	Well drained to somewhat excessively drained.	Low available water capacity. TwD: slope.	Sand to a depth of 56 inches. TWD: slope.
Features generally favorable.	Fair to poor compaction characteristics.	Flooding; slow permeability.	Slow permeability; seasonal high water table.	Nearly level.
Highly permeable material in the upper 24 inches of the profile.	Sandy material to a depth of about 24 inches.	Well drained	Mainly coarse sand to a depth of about 24 inches; slope.	Susceptible to gullying.

Drainage for crops and pasture is affected mainly by lack of suitable outlets. Other features significant in drainage are a seasonal high water table, slow permeability, and susceptibility to flooding.

Features that affect sprinkler irrigation are available water capacity, intake rate, slope, productivity, and permeability. Because of the kinds of crops grown, the practice of sprinkler irrigation is not widespread in the two counties.

Some of the soil features to be considered in constructing terraces and diversions are depth of the soil, erodibility, intake rate, kind of material below the surface layer, and permeability. Slow permeability and undesirable material in the underlying layers are the most common adverse features in these counties.

Use of the Soils for Town and Country Planning

This section was prepared chiefly for planners, developers, landscape architects, builders, zoning officials, realtors, landowners, and others interested in use of the soils in Appling and Jeff Davis Counties for town and country planning.

In selecting a site for a home, a street, an industry, recreational uses, or other nonfarm purposes, the suitability of the soils for the intended use must be determined at each site being considered. Some of the more common properties affecting the use of the soils for nonfarm purposes are soil texture, reaction, and depth; shrink-swell potential; steepness of slopes; permeability; depth to hard rock and to the water table; and the hazard of flooding. On the basis of these and related characteristics, soil scientists and engineers have rated the soils of Appling and Jeff Davis Counties for specific nonfarm purposes. The ratings and the nature of the soil limitations that influenced the ratings are shown in table 8.

The ratings used are *slight*, *moderate*, and *severe*, and they are applied to the soils as they occur naturally. If the rating is *slight*, the soils have properties favorable for the rated use. Limitations are so minor that they can be easily overcome. Good performance can be expected from these soils, and little maintenance is required. Soils rated as *moderate* have properties moderately favorable for the rated use. Limitations can be overcome or modified by planning, design, or special maintenance. If the rating is *severe*, the soils have one or more properties unfavorable for the rated use. Limitations are difficult and costly to modify or overcome, and they require major soil reclamation, special design, or intensive maintenance.

In the paragraphs that follow, each nonfarm use is defined and the properties important in rating the limitations of the soils for such purposes are given. The information can be used, along with table 8, with information in other parts of the survey, and with the soil map at the back of the survey, as a guide in planning the use of the soils for nonfarm purposes. Before beginning most construction projects, however, an investigation should be made at the site being considered.

Building sites for residences.—These areas are used for homes or family dwellings. The ratings and limitations in table 8 are for houses that are without basements and are no more than three stories high. The soil properties most important in rating the soils are the ability to support loads, shrink-swell potential, depth to seasonally high water table, susceptibility to flooding, slope, and depth to hard rock (fig. 11). The kind of sewage system is not a part of the evaluation for residences.

Building sites for light industries.—These areas are used for stores, offices, and small industries. They are not more than three stories high. The soil properties important in rating the soils for this use are slope, depth to the water table and to hard rock, susceptibility to flooding, and shrink-swell potential. It is assumed that sewage disposal facilities are available, and these are not considered in the rating.

Septic tank filter fields.—A septic tank filter field (*11*) is a sewage system in which waste is collected in a central tank and the effluent from the tank is dispersed over a fairly large area of filter field lines buried in the soil. The soil properties most important in rating the soils for the proper operation of such a system are depth to the seasonal high water table and to hard rock, susceptibility to flooding, slope, and permeability.

Sewage lagoons.—A sewage lagoon (*3*) consists of an impounding area and a dam. The chief requirements of a soil for use as a floor for the basin of a lagoon are (1) effective sealing against seepage, (2) an even, level or nearly level surface, and (3) little or no content of organic matter. The soil properties most important in rating the soils for this use are permeability, depth to water table, the suitability of the material at the site for a dam, depth to hard rock, slope, content of organic matter, and content of coarse fragments more than 6 inches in diameter. Generally, a sewage lagoon should be planned to hold sewage within a depth of 2 to 5 feet long enough for bacteria to decompose the solids.

Picnic grounds are park-type picnic areas. They are subject to heavy foot traffic, but most vehicular traffic is confined to access roads. Preparation of an area consists of leveling sites for tables and fireplaces and building access roads. The assumption is made that good vegetative cover can be established and maintained. Soil limitations for waste disposal and for playgrounds are treated as separate items. Important properties affecting use of the soils for picnic grounds are wetness, susceptibility to flooding, slope, texture of the surface layer, and rockiness. Prime requirements for this use are freedom from muddiness and dustiness. Strong slopes and rockiness greatly increase the cost of site leveling and building access roads.

Campsites are those areas to be used intensively for tents and small camp trailers and the accompanying activities of outdoor living. Little site preparation is normally required other than shaping and leveling for tent and parking areas. These areas are subject to heavy foot traffic and limited vehicular traffic. The assumption is made that good vegetative cover can be established and maintained. The best soils have mild slopes, good drainage, a surface free of rocks and coarse fragments, freedom from flooding during periods of heavy use, and a surface layer that is firm, even after rain, but is not dusty when dry.

***Figure 11.*—Pelham loamy sand has severe limitations for building sites because of wetness.**

Intensive play areas are those areas that are used frequently for sports, such as baseball, football, badminton, and other organized games. These areas are subject to intensive foot traffic. The assumption is made that good vegetative cover can be established and maintained. Soil properties that affect the use of the soil for playgrounds are (1) those that affect intensive foot traffic and (2) those that affect design, construction, and maintenance. The best soils for playgrounds have a nearly level surface that is free of coarse fragments and rock outcrops, good drainage, freedom from flooding during periods of heavy use, and a surface layer that is firm, even after rain, and is not dusty when dry.

Trafficways are improved local roads and streets that carry automobile traffic all year. These streets and roads have some kind of all-weather surfacing, commonly asphalt or concrete. They are built mainly from the soil at hand and cut and fills are limited, usually to about 6 feet or less. Soil properties that affect design and construction are mainly wetness, susceptibility to flooding, slope, the ability to support loads, and the workability of the soil as subgrade material.

Formation and Classification of the Soils

This section has two main parts. The first part describes the factors of soil formation and their effect on the soils in Appling and Jeff Davis Counties. The second part explains the current system for classifying soils and places the soil series in some of the higher categories of that system.

TABLE 8.—*Limitations of the soils*

An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils for referring to other series that

Soil series and map symbols	Building sites for—		Sewage disposal systems	
	Residences	Light industries	Septic tank filter fields	Sewage lagoons
Albany: Ad	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Severe: moderately rapid permeability in upper 44 inches.
Bayboro: Bf	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Cahaba: CX	Slight	Slight	Slight	Severe: permeability more than 2.0 inches per hour in the upper and lower layers.
Carnegie: CnB, CnC	Moderate: moderate shrink-swell potential.	Moderate: moderate shrink-swell potential.	Severe: slow permeability.	Moderate: slope
Cowarts: CqB, CqC	Slight	Slight for CqB, moderate for CqC: slope.	Severe: slow permeability.	Moderate: slope
Coxville: Cv	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.
Dunbar:				
DvB	Moderate: moderate shrink-swell potential.	Moderate: moderate shrink-swell potential.	Severe: seasonal high water table.	Moderate: slope
DvD	Moderate: slope; seasonal high water table.	Severe: slope	Severe: seasonal high water table.	Severe: slope
Duplin: DwB, DwC	Moderate: moderate shrink-swell potential.	Moderate: moderate shrink-swell potential.	Severe: slow permeability.	Moderate: slope
Fuquay: FsB	Slight	Slight	Moderate: slow permeability below a depth of about 4 feet.	Moderate: slope; moderately rapid to moderate permeability in the upper part.
Hazlehurst: Hi	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Irvington: Ij	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: moderately slow permeability.	Slight to moderate: seasonal high water table.
Johns: Jc	Severe: flooding; seasonal high water table.	Severe: flooding; seasonal high water table.	Severe: seasonal high water table; flooding.	Severe: flooding
*Johnston: Jd. For the Rains part, see the Rains series.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: flooding; seasonal high water table.
Kershaw: KdC	Slight	Moderate: slope	Moderate: very rapid permeability; nearby water supply may be contaminated.	Severe: very rapid permeability.
Leefield: LL, Ls	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Mascotte: Mn	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.

for town and country planning

in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions appear in the first column of this table]

Recreational facilities			Trafficways
Picnic grounds	Campsites	Intensive play areas	
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Slight	Slight	Slight	Slight.
Slight	Slight	Moderate for CnB; severe for CnC: slope.	Moderate: moderate shrink-swell potential.
Slight	Slight	Moderate for CqB; severe for CqC: slope.	Slight.
Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.
Moderate: seasonal high water table. Moderate: slope; seasonal high water table.	Moderate: seasonal high water table. Moderate: slope; seasonal high water table.	Moderate: seasonal high water table; slope. Severe: slope; seasonal high water table.	Severe: moderate shrink-swell potential. Severe: sandstone outcrop; moderate shrink-swell potential.
Moderate: seasonal high water table.	Moderate: slow permeability	Moderate for DwB; severe for DwC: slope.	Moderate: moderate shrink-swell potential.
Moderate: upper 22 inches is loamy sand.	Moderate: upper 22 inches is loamy sand.	Moderate: upper 22 inches is loamy sand.	Slight.
Moderate: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Moderate: seasonal high water table.	Slight.
Moderate: seasonal high water table; flooding.	Moderate: seasonal high water table; flooding.	Moderate: seasonal high water table; flooding.	Moderate: seasonal high water table; flooding.
Severe: flooding; seasonal high water table.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.
Severe: surface layer is loose sand.	Severe: surface layer is loose sand.	Severe: surface layer is loose sand; slope.	Slight.
Moderate: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Moderate: seasonal high water table.

TABLE 8.—*Limitations of the soils*

Soil series and map symbols	Building sites for—		Sewage disposal systems	
	Residences	Light industries	Septic tank filter fields	Sewage lagoons
Norfolk: NhA, NhB	Slight	Slight	Slight	Moderate: moderate permeability.
Olustee: Oa	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Pelham: Pl	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Rains. Mapped only in an undifferentiated group with Johnston soils.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Sunsweet: ShD2	Moderate: moderate shrink-swell potential; slope.	Severe: slope	Severe: moderately slow permeability.	Severe: slope
Surrency: Sv	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Tifton: TqA, TqB	Slight	Slight	Moderate: moderate permeability.	Moderate: moderate permeability.
*Troup: TpB	Slight	Slight	Slight	Severe: rapid permeability in upper 4½ feet.
TWD. For the Wicksburg part of TWD, see the Wicksburg series.	Moderate: slope	Severe: slope	Moderate: slope	Severe: slope
*Wahee: WW. For the Coxville part of this unit, see the Coxville series.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.
Wicksburg: WvC	Moderate: moderate shrink-swell potential.	Moderate: slope	Severe: moderately slow permeability.	Moderate: slope
Wicksburg part of unit TWD.	Moderate: slope	Severe: slope	Severe: moderately slow permeability.	Severe: slope

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Recreational facilities			Trafficways
Picnic grounds	Campsites	Intensive play areas	
Slight	Slight	Slight	Slight.
Severe: seasonal high water table.	Moderate: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Moderate: slope	Moderate: slope	Severe: slope	Moderate: moderate shrink-swell potential; slope.
Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.	Severe: seasonal high water table.
Slight	Slight	Slight for TqA; moderate for TqB: slope.	Slight.
Severe: upper 4½ feet is sand	Severe: upper 4½ feet is sand	Severe: upper 4½ feet is sand	Slight.
Severe: upper 4½ feet ranges from coarse sand to fine sand.	Severe: upper 4½ feet ranges from coarse sand to fine sand.	Severe: upper 4½ feet ranges from coarse sand to fine sand.	Moderate: slope.
Severe: flooding; seasonal high water table.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.	Severe: seasonal high water table; flooding.
Moderate: upper 2 feet is mainly gravelly coarse sand.	Moderate: upper 2 feet is mainly gravelly coarse sand.	Severe: slope	Moderate: moderate shrink-swell potential in the 28- to 60-inch layer.
Moderate: upper 2 feet is mainly gravelly coarse sand.	Moderate: upper 2 feet is mainly gravelly coarse sand.	Severe: slope	Moderate: moderate shrink-swell potential in the 28- to 60-inch layer.

Formation of the Soils

The principal environmental factors in soil formation are parent material, plants and animals, climate, relief, and time. The nature of the soil at any point on the earth's surface depends upon the combination of these factors. The relative importance of each factor differs from place to place. In some places one factor may dominate in the formation of the soils and determine most of the soil properties. For example, soils that formed in pure quartz sand commonly have faint horizons because quartz is highly resistant to weathering. Even in quartz sand, however, a distinct profile can form under certain types of vegetation if the relief is low and flat and the water table is high.

The five factors that affect soil formation are described in the following paragraphs.

Parent material

Parent material is the unconsolidated mass from which a soil forms. It largely determines the chemical and mineralogical composition of a soil. The parent material of most of the soils in Appling and Jeff Davis Counties is unconsolidated, fragmentary material that was deposited by water. It ranges from coarse sand to fine clay in texture.

The parent material of the soils in the two counties weathered from six geologic formations or deposits (*4*). From the oldest to the youngest, these formations are Hawthorn, Brandywine, Coharie, Sunderland, Penholoway, and Alluvial and undifferentiated terrace deposits along the Altamaha and Ocmulgee Rivers.

The Hawthorn formation makes up the largest part of Jeff Davis County and is in the northern and southern parts of Appling County. This formation is of the Miocene epoch and ranges from about 10 to 70 feet in thickness. Examples of soils that formed in material derived from this formation are the Tifton, Fuquay, and Troup soils.

The Brandywine formation is of the Pleistocene epoch and lies mostly in the center of the two counties. Some of the soils that formed in material derived from this formation are the Leefield, Hazlehurst, and Irvington soils.

The Coharie formation is of the Pleistocene epoch and lies mostly in the central and southern parts of Appling County. The soils that formed in material derived from this formation are mainly the Olustee, Pelham, Leefield, and Surrency soils.

The Sunderland formation is of the Pleistocene epoch and lies in Appling County near the Wayne County line. Typical soils that formed in material derived from this formation are the Hazlehurst and Irvington soils.

The Penholoway formation is of the Pleistocene epoch and occurs along the Altamaha River in Appling County. The main soils that formed in material derived from this formation are the Wahee and Johns soils.

Alluvial and undifferentiated terrace deposits are on the flood plains and terraces along the Altamaha and Ocmulgee Rivers in both counties. These deposits were laid down in the Recent epoch and have a maximum thickness of about 24 feet. They are the parent material of the Coxville and Wahee soils.

Plants and animals

Plants, animals, bacteria, and other organisms are active in the soil-forming processes. Each kind of living organism brings about particular changes in the soil material. The kinds and numbers of plants and animals that live on and in the soil depend, in large part, on climate and, in varying degrees, on parent material, relief, wetness, and the age of the soil.

Large plants are responsible for supplying most of the organic matter to the soil. They also transfer elements from the subsoil to the surface soil by assimilating these elements into their tissue and then depositing this tissue on the surface in the form of fallen fruit, leaves, or stems. The uprooting of trees by wind influences the formation of soils by mixing the soil layers and loosening the underlying material.

In Appling and Jeff Davis Counties, the native vegetation was chiefly pine and oak on uplands and sweetgum, blackgum, pondcypress, and water-tolerant oaks in the low, swampy areas. These trees returned large amounts of organic material to the soils over a long period.

Micro-organisms, insects, small plants, and small animals exert a continual effect on the physical and chemical properties of the soil. Bacteria, fungi, and other micro-organisms speed the weathering of rock and the decomposition of organic mater. Earthworms and other small invertebrates carry on a slow, continual cycle of soil mixing. Earthworms may also alter the soil chemically.

Climate

Climate, particularly temperature and rainfall, largely determines the rate and nature of the physical, chemical, and biological processes that affect the weathering of soil material. Rainfall, freezing, thawing, wind, and sunlight have much to do with the breakdown of rocks and minerals, the release of chemicals, and other processses that affect the formation of soils. The amount of water that percolates through the soil depends on rainfall, relative humidity, length of the frost-free period, soil permeability, and physiographic position. Temperature influences the kinds and growth of organisms and the speed of physical and chemical reactions in the soils.

The warm, humid climate of Appling and Jeff Davis Counties is characterized by long, hot summers and short, mild winters. The average rainfall is about 47 inches per year. The soils are moist and subject to leaching much of the time from the first part of December through July. They are not so moist during much of August, September, October, and the first half of November. Because the surface soil is frozen for only short periods, freezing and thawing have little effect on the formation of soils. The climate throughout the two counties is uniform and has had about the same effect on soil formation in all areas. As is normal in this climate, most of the soils on uplands in Appling and Jeff Davis Counties are highly weathered, leached, strongly acid or very strongly acid, and low in natural fertility.

Relief

Relief, through its effect on drainage, erosion, and plant cover, modifies the effect of vegetation and climate on soil formation. Although most of the soils in Appling

and Jeff Davis Counties are level or nearly level, soil formation has been affected by three general kinds of landscape—low, wet flats; broad, smooth ridges; and higher sand ridges.

The low flats are broad but are broken by swampy or ponded areas and by sluggish drainageways. The water table is near the surface for long periods. Most of the soils on low flats are poorly drained and very poorly drained, and they are gray and typically are mottled.

The broad ridges are broken by small, rounded ponds and by small streams. These small streams have cut below the general level of the plain and have formed very gently sloping to strongly sloping side slopes. The water table typically is several feet below the surface. The soils on broad ridges are moderately well drained and well drained and are mainly yellowish to brownish in color.

The higher sand ridges have rolling relief and are dissected by streams. The soils on these landscapes are deep and typically are sandy to a depth of about 2 to 5 feet or more. The water table is more than 6 feet below the surface.

Time

The length of time required for a well-developed profile to form in a soil depends on the degree that the other factors affect soil formation (*8*). Less time is generally required for a profile to develop in a warm, humid climate than is required in a cold, dry climate because moisture and a warm temperature accelerate the chemical and biological activity in the soil material. Also, less time is required for the formation of a distinct profile in moderately permeable soil material than in slowly permeable material. If time is sufficient, the soil is modified so that the genetic horizons of an A, B, C sequence are formed.

In Appling and Jeff Davis Counties, the soils that formed in alluvium along the first bottoms of streams lack well-defined, genetically related horizons because the soil material has not been in place long enough for a well-developed profile to form. Johnston soils are an example of soils formed on the first bottoms along streams. The Sunsweet soils have been in place long enough for the development of well-defined horizons, but their profile is not so well developed as that of some other soils in the counties. Profile development is somewhat retarded by slowly permeable parent material and lack of much movement of water in the profile. The Tifton and Norfolk soils, on the other hand, have a well-developed profile. They have been in place a long time, and their subsoil is moderately permeable. Because water easily reaches the parent material, distinct horizons have formed.

Classification of the Soils

Classification is an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interelationships. Classification is also useful in organizing and applying the results of experience and research.

Soils are placed in narrow classes for use in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped in progressively fewer and broader classes in successively higher categories so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States. The older of these systems was adopted in 1938 (*7*) and revised and expanded later (*6*). The system currently used by the Soil Conservation Service was adopted in January 1965 (*5*, *9*) and is undergoing continual study. Readers interested in the development of this system should refer to the latest literature available.

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, the suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are measurable or observable, but the properties are selected so that soils of similar genesis are grouped together.

In table 9 the soil series of Appling and Jeff Davis Counties are classified in several higher categories of the current system of classification. Placement of some soil series in the current system, particularly in families, may change as more precise information becomes available.

The categories of the current system are defined briefly in the following paragraphs.

ORDER: Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. The exceptions, Entisols and Histosols, occur in many different climates. Entisols, Inceptisols, Spodosols, and Ultisols are the soil orders represented in Appling and Jeff Davis Counties.

Entisols are recent mineral soils that lack genetic horizons or have only the beginnings of such horizons.

Inceptisols are mineral soils in which horizons have started to develop. They generally are on young, but not recent, land surfaces.

Spodosols are mineral soils that have a spodic horizon.

Ultisols are mineral soils that have a clay-enriched horizon and a base saturation of less than 35 percent at a depth of 50 inches below the top of the clay-enriched horizon.

SUBORDER: Each order is divided into suborders, primarily on the basis of soil characteristics that seem to produce classes having the greatest genetic similarity. The suborders have a more narrow climatic range than the orders. The criteria for suborders chiefly reflect either the presence or absence of waterlogging or soil differences resulting from climate or vegetation.

GREAT GROUP: Each suborder is divided into great groups according to the presence or absence of genetic horizons and the arrangement of these horizons.

SUBGROUP: Each great group is divided into subgroups. One of these subgroups represents the central (typic) concept of the great group, and the others, called intergrades, are made up of soils that have mostly the properties of one great group but also have one or more properties of another great group, suborder, or order.

FAMILIES: Each subgroup is divided into families, primarily on the basis of properties important to the growth of plants or to the behavior of soils if used for engineering. Some of the properties considered are tex-

TABLE 9.—*Classification of soil series according to the comprehensive system, 7th approximation*

Series	Family	Subgroup	Order
Albany	Loamy, siliceous, thermic	Grossarenic Paleudults	Ultisols.
Bayboro	Clayey, mixed, thermic	Umbric Paleaquults	Ultisols.
Cahaba	Fine-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
Carnegie	Fine-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Cowarts	Fine-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Coxville	Clayey, kaolinitic, thermic	Typic Paleaquults	Ultisols.
Dunbar	Clayey, kaolinitic, thermic	Aeric Paleaquults	Ultisols.
Duplin	Clayey, kaolinitic, thermic	Aquic Paleudults	Ultisols.
Fuquay [1]	Loamy, siliceous, thermic	Arenic Plinthic Paleudults	Ultisols.
Hazlehurst	Fine-loamy, siliceous, thermic	Plinthudic Fragiaquults	Ultisols.
Irvington	Fine-loamy, siliceous, thermic	Plinthic Fragiudults	Ultisols.
Johns [2]	Fine-loamy, siliceous, thermic	Aquic Hapludults	Ultisols.
Johnston	Coarse-loamy, siliceous, acid, thermic	Cumulic Humaquepts	Inceptisols.
Kershaw	Siliceous, thermic, uncoated	Typic Quartzipsamments	Entisols.
Leefield	Loamy, siliceous, thermic	Arenic Plinthaquic Paleudults	Ultisols.
Mascotte	Sandy over loamy, siliceous, thermic	Ultic Haplaquods	Spodosols.
Norfolk	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Olustee [3]	Sandy over loamy, siliceous, thermic	Ultic Haplaquods	Spodosols.
Pelham	Loamy, siliceous, thermic	Arenic Paleaquults	Ultisols.
Rains	Fine-loamy, siliceous, thermic	Typic Paleaquults	Ultisols.
Sunsweet	Clayey, kaolinitic, thermic	Plinthic Paleudults	Ultisols.
Surrency	Loamy, siliceous, thermic	Arenic Umbric Paleaquults	Ultisols.
Tifton	Fine-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Troup	Loamy, siliceous, thermic	Grossarenic Paleudults	Ultisols.
Wahee	Clayey, kaolinitic, thermic	Aeric Ochraquults	Ultisols.
Wicksburg	Clayey, kaolinitic, thermic	Arenic Paleudults	Ultisols.

[1] These soils are taxadjuncts to the Fuquay series in a significant number of pedons because they lack iron nodules in the A horizon.
[2] These soils are taxadjuncts to the Johns series because their solum is thicker than is defined in the range for the series.
[3] These soils are taxadjuncts to the Olustee series in nearly half the pedons mapped because they have a loamy argillic horizon slightly below a depth of 40 inches.

ture, mineralogy, reaction, soil temperature, permeability, consistence, and thickness of horizons.

SERIES: The series has the most narrow range of characteristics of the categories in the classification system. It consists of a group of soils that formed from a particular kind of parent material and have genetic horizons that, except for the texture of the surface layer, are similar in differentiating characteristics and in arrangement in the soil profile. Among these characteristics are color, structure, reaction, consistence, and mineralogical and chemical composition. Detailed descriptions of each soil series in the survey area are given in the section "Descriptions of the Soils."

New soil series must be established and concepts of some established series, especially older ones that have been used little in recent years, must be revised in the course of the soil survey program. A proposed new series has tentative status until review of the series concept at national, state, and regional levels of responsibility for classification results in a judgment that the new series should be established. All of the soil series in this publication are established.

Additional Facts About the Counties

This section tells about the organization and population; climate; agriculture; transportation, markets, and industry; and water supply in Appling and Jeff Davis Counties.

Organization and Population

Appling County was created by Legislative Act of December 15, 1818, out of treaty lands negotiated from the Creek Indians. It was the 40th county in Georgia in order of organization and was named in honor of Colonel Daniel Appling.

Jeff Davis County was created by Legislative Act of August 18, 1905, from part of Appling and Coffee Counties and was 140th in order of counties organized in Georgia. It was named for Jefferson Davis, President of the Confederate States of America.

Early settlers came from Virginia, North Carolina, South Carolina, and other parts of Georgia. These settlers grew corn and cotton and raised hogs, cattle, and chickens for home use or for trading locally.

The population of Appling County was 12,726 in 1970. In that year about 72.5 percent of the population was classed as rural. By contrast, 39.0 percent of the population was classed as rural in 1960.

The population of Jeff Davis County was 9,425 in 1970. In that year about 57 percent of the population was classed as rural. By contrast, 58.5 percent of the population was classed as rural in 1960.

Since 1970, the estimated percentage of people in rural areas of both counties has declined as many persons who formerly operated farms have accepted industrial employment in Baxley, Hazlehurst, and other nearby cities.

Climate [6]

Appling and Jeff Davis Counties are located on the Lower Coastal Plain of Georgia, 50 to 75 miles from the Atlantic Ocean. This subtropical location results in long summers that are warm and humid, winters that are short and mild, and rainfall that is adequate for farming in most years. Data on temperature and precipitation are given in table 10, and the probabilities of freezing temperatures on specified dates in spring and fall are given in table 11.

Summer temperatures are consistently warm and vary little from day to day. Early morning temperatures in summer average near 70° F. High temperatures in the afternoon reach or exceed 90° on about two-thirds of the days from June through August and on almost a third of the days in May and September. Because of the moderating effect of the ocean, however, periods of extremely high temperatures are rare. Usually there are only about 3 days per year having a temperature of 100° or higher. The highest temperature of record was 106° in June 1959. The relative humidity is moderately high in summer. The average is above 90 percent from 2 to 7 a.m., but it drops to around 60 percent from noon to 3 p.m.

The relatively mild winters permit normal outside activity most of the time. Outbreaks of cold air from the north moderate considerably by the time they reach the area and usually last for only 2 or 3 days. Freezing temperatures occur on about 25 days in an average winter. A temperature lower than 20° may be expected during only about half the winters, and daytime temperatures rise to well above freezing during even the coldest weather. The freeze-free period averages about 260 days and extends from around March 10 to November 24. The relative humidity is generally lower in winter than in summer for most hours of the day, and the largest differences are early in the morning.

Spring and fall are transitional seasons. They are usually mild, but there is gradual warming in spring and cooling in fall. Mean temperatures in spring range from 59° in March to 73° in May. Mean temperatures in fall range from 76° in September to 58° in November. There is more sunshine and less wind and rain in fall than in spring. The long periods of mild, sunny weather that are typical of autumn are ideal for harvesting operations.

Average annual rainfall for the area is between 45 and 50 inches. The wettest season is summer, when moisture requirements for farming are greatest. Most warm-season rainfall comes as thundershowers that are usually of short duration and cause a minimum of interruption of normal activities. Winter rainfall is more frequently associated with cyclonic storms that move from southwest to northeast through or near the area. Rainy periods in winter may last for several hours or even 2 or 3 days. Occasionally a tropical cyclone moves near enough to bring very heavy rainfall to the area. Snowfall is rare and is of no climatic significance.

Tornado-type storms have occurred in the two counties on a few occasions, and some of the more severe thunderstorms have produced locally damaging winds and hail.

[6] By HORACE S. CARTER, State climatologist, National Weather Service, U.S. Department of Commerce, Athens, Ga.

Agriculture

Agriculture has long been one of the main sources of income in Appling and Jeff Davis Counties. The soils, climate, and growing season are suited to many kinds of

TABLE 10.—*Temperature and precipitation*

Month	Temperature				Precipitation		
	Average daily maximum	Average daily minimum	Two years in 10 will have at least 4 days with— Maximum temperature equal to or higher than—	Two years in 10 will have at least 4 days with— Minimum temperature equal to or lower than—	Average total	One year in 10 will have— Less than—	One year in 10 will have— More than—
	F.	*F.*	*° F.*	*° F.*	*Inches*	*Inches*	*Inches*
January	62.7	39.3	77	26	2.85	1.0	6.1
February	65.3	41.7	80	27	3.50	1.2	7.0
March	71.0	46.8	85	31	4.39	1.4	7.4
April	78.6	53.8	88	42	3.82	1.2	6.3
May	86.0	61.2	94	51	3.48	1.0	6.6
June	90.4	67.9	100	62	4.72	2.0	8.0
July	91.3	70.2	100	67	6.21	3.3	10.6
August	91.4	70.0	98	66	5.43	2.2	9.5
September	86.4	66.2	95	59	4.76	.8	9.9
October	79.1	55.3	88	43	2.65	.3	5.5
November	70.4	45.3	82	31	1.97	.5	4.5
December	63.0	39.3	77	26	3.11	.9	6.4
Year	78.0	54.8	[1] 102	22	46.89	36.8	60.9

[1] The extreme temperature that will be equalled or exceeded on at least 4 days in 2 years out of 10.

TABLE 11.—*Probabilities of last freezing temperatures in spring and first freezing temperatures in fall*

Probability	Dates for given probability and temperature		
	24° F. or lower	28° F. or lower	32° F. or lower
Spring:			
1 year in 10 later than	February 20	March 14	March 30
2 years in 10 later than	February 10	March 4	March 21
5 years in 10 later than	January 15	February 20	March 10
Fall:			
1 year in 10 earlier than	November 22	November 16	November 2
2 years in 10 earlier than	November 29	November 20	November 10
5 years in 10 earlier than	December 12	December 2	November 24

crops. General farm crops, naval stores, and pulpwood are the main agricultural products, but livestock, poultry, and catfish are increasing in importance.

In 1969, there were 1,417 farms in the counties, and the average size of farm was about 207 acres. In 1959, there were 1,792 farms in the counties, and the average size of farm was about 160 acres.

Transportation, Markets, and Industry

U.S. Highways 1, 23, 221, and 341 extend through the counties. State Highways 19, 27, 99, 107, 121, 135, 144, and 268 are the main ones that pass through the counties, and many county roads are serviceable throughout the year. Appling and Jeff Davis Counties are served by the Southern Railway.

Markets are available in Baxley and Hazlehurst for corn, tobacco, cattle, and hogs.

Several industrial plants are in Hazlehurst and Baxley. Many people who work in these plants commute daily from nearby rural areas.

Water Supply

Water for municipal, industrial, and agricultural needs in the two counties is obtained from deep wells, shallow wells, and ponds. Some of the deep wells are as much as 650 feet deep or more. The Altamaha River, one of the largest streams in Georgia, supplies adequate water for processing and disposing of industrial waste. The average daily flow of the Altamaha River is 8 billion gallons (*12*) (fig. 12). The minimum flow is 927 million gallons a day, and the maximum is 115 billion gallons a day (*12*). Artesian wells supply water for both Baxley and Hazlehurst.

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

***Figure 12.*—The Altamaha River at about normal flow.**

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Drainage class (natural). Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepen-

ing of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and the C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle, subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Intake (infiltration). The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is the movement of water through soil layers or material.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Organic matter. A general term for plant and animal material, in or on the soil, in all stages of decomposition. Readily decomposed organic matter is often distinguished from the more stable forms that are past the stage of rapid decomposition.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents that commonly shows as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to hardpan or to irregular aggregates upon repeated wetting and drying. It is a form of laterite.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Mildly alkaline	7.4 to 7.8
Very strongly acid	4.5 to 5.0	Moderately alkaline	7.9 to 8.4
Strongly acid	5.1 to 5.5	Strongly alkaline	8.5 to 9.0
Medium acid	5.6 to 6.0	Very strongly alkaline	9.1 and higher
Slightly acid	6.1 to 6.5		
Neutral	6.6 to 7.3		

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips, or bands, to serve as vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Surface layer. A term used in nontechnical soil descriptions for one or more layers above the subsoil. Includes A horizon and part of B horizon; has no depth limit.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Topsoil. A presumed fertile soil or soil material, or one that responds to fertilization, ordinarily rich in organic matter, used to topdress roadbanks, lawns, and gardens.

Upland (geology). Land consisting of material unworked by water in recent geologic time and lying, in general, at a higher elevation than the alluvial plain or stream terrace. Land above the lowlands along rivers.

GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and the description of the soil series to which the mapping unit belongs. The suitability of the soils for use as cropland is discussed in the soil descriptions. The capability classification is discussed on pages 33 and 34. For information on the use of the soils for woodland, see the section beginning on page 35, including table 3 on page 37. Other information is given in tables as follows:

Acreage and extent, table 1, page 6.
Estimated yields, table 2, page 35.
Wildlife, table 4, page 39.
Use of the soils for engineering, tables 5, 6, and 7, pages 42 through 51.
Town and country planning, table 8, page 54.

Map symbol	Mapping unit	Page	Capability unit	Woodland suitability group
			Symbol	Number
Ad	Albany sand	7	IIIw-1	3w2
Bf	Bayboro loam	8	Vw-1	2w9
CnB	Carnegie loamy sand, 2 to 5 percent slopes	9	IIe-4	2o1
CnC	Carnegie loamy sand, 5 to 8 percent slopes	9	IVe-4	2o1
CqB	Cowarts loamy sand, 2 to 5 percent slopes	11	IIe-4	2o1
CqC	Cowarts loamy sand, 5 to 8 percent slopes	11	IVe-4	2o1
Cv	Coxville loam	11	Vw-1	2w9
CX	Cahaba loamy sand	8	I-1	2o7
DvB	Dunbar loamy sand, 2 to 5 percent slopes	12	IIe-3	2w8
DvD	Dunbar loamy sand, 5 to 12 percent slopes	12	VIe-2	2w8
DwB	Duplin loamy sand, 2 to 5 percent slopes	13	IIe-3	2w8
DwC	Duplin loamy sand, 5 to 8 percent slopes	13	IIIe-3	2w8
FsB	Fuquay loamy sand, 0 to 5 percent slopes	14	IIs-1	3s2
Hi	Hazlehurst loamy sand	15	IIIw-2	2w8
Ij	Irvington loamy sand	16	IIw-2	2o7
Jc	Johns sandy loam	16	IIw-2	2w2
Jd	Johnston and Rains soils	17	Vw-2	---
	Johnston part	--	----	1w9
	Rains part	--	----	2w3
KdC	Kershaw sand, 2 to 8 percent slopes	17	VIIs-1	5s3
LL	Leefield soils	19	IIw-2	3w2
Ls	Leefield loamy sand	19	IIw-2	3w2
Mn	Mascotte sand	21	Vw-4	3w2
NhA	Norfolk loamy sand, 0 to 2 percent slopes	21	I-1	2o1
NhB	Norfolk loamy sand, 2 to 5 percent slopes	22	IIe-1	2o1
Oa	Olustee sand	22	IIIw-1	3w2
Pl	Pelham loamy sand	25	IVw-4	2w3
ShD2	Sunsweet sandy loam, 5 to 12 percent slopes, eroded	26	VIe-2	3c2
Sv	Surrency loamy sand	27	Vw-2	2w9
TpB	Troup sand, 0 to 5 percent slopes	29	IIIs-1	3s2
TqA	Tifton loamy sand, 0 to 2 percent slopes	28	I-2	2o1
TqB	Tifton loamy sand, 2 to 5 percent slopes	28	IIe-2	2o1
TWD	Troup-Wicksburg complex, 8 to 12 percent slopes	29	VIs-1	3s2
WvC	Wicksburg gravelly coarse sand, 2 to 8 percent slopes	32	IVs-1	3s2
WW	Wahee and Coxville soils	30	IVw-4	2w8

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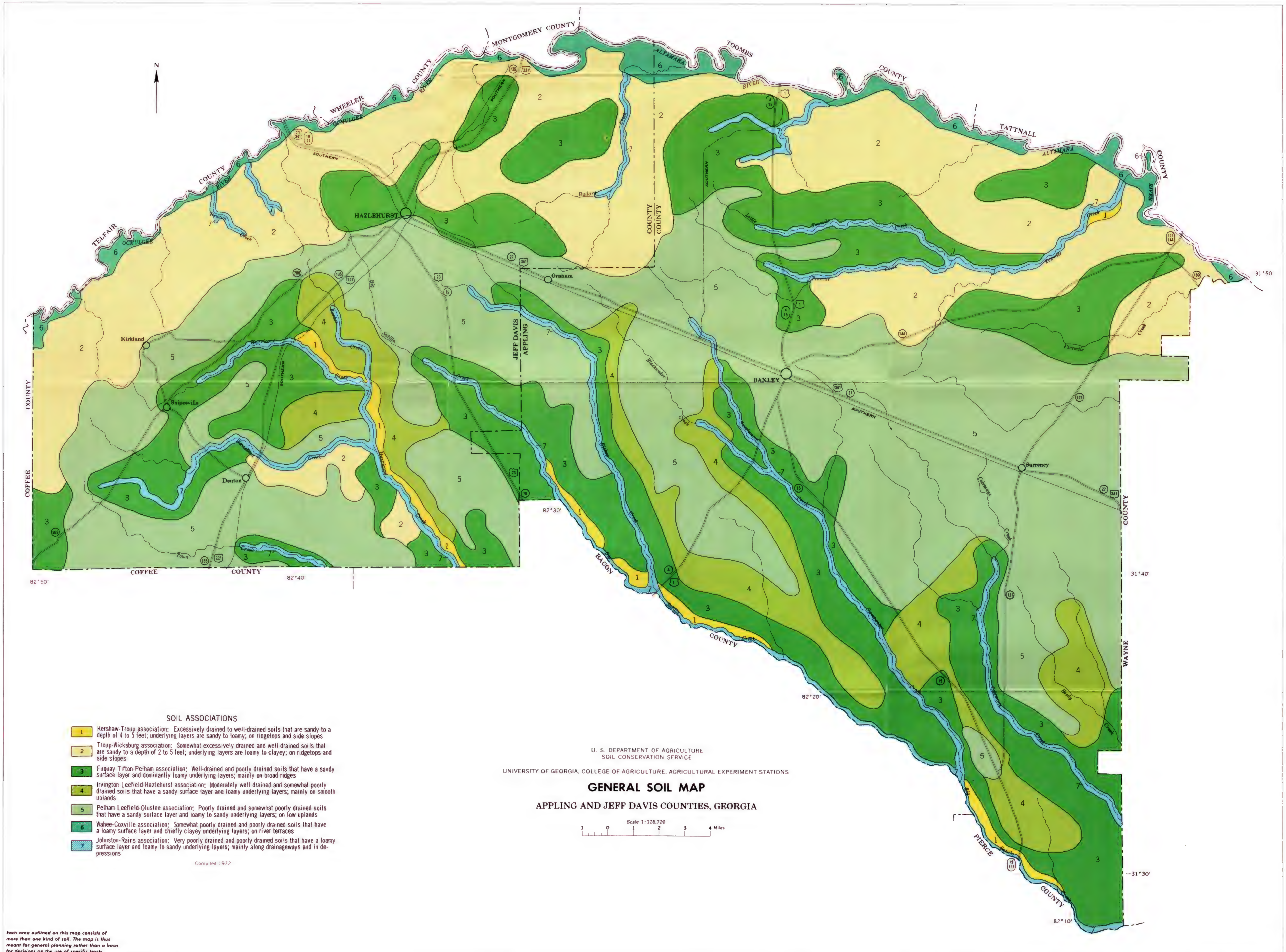
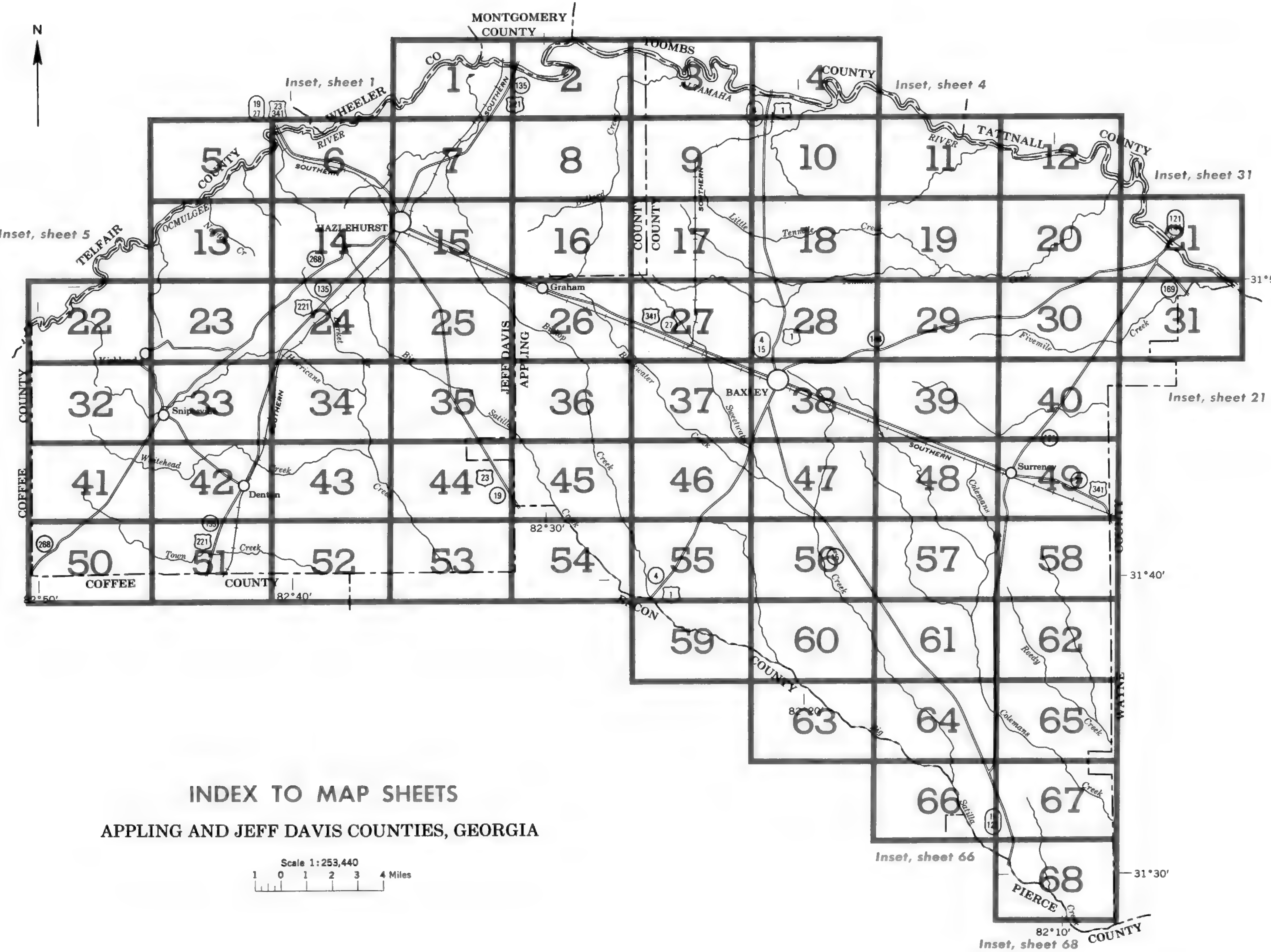

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
UNIVERSITY OF GEORGIA, COLLEGE OF AGRICULTURE, AGRICULTURAL EXPERIMENT STATIONS
GENERAL SOIL MAP
APPLING AND JEFF DAVIS COUNTIES, GEORGIA
Scale 1:126,720
1 0 1 2 3 4 Miles
SOIL ASSOCIATIONS
1 Kershaw-Troup association: Excessively drained to well-drained soils that are sandy to a depth of 4 to 5 feet; underlying layers are sandy to loamy; on ridgetops and side slopes
2 Troup-Wicksburg association: Somewhat excessively drained and well-drained soils that are sandy to a depth of 2 to 5 feet; underlying layers are loamy to clayey; on ridgetops and side slopes
3 Fuquay-Tifton-Pelham association: Well-drained and poorly drained soils that have a sandy surface layer and dominantly loamy underlying layers; mainly on broad ridges
4 Irvington-Leefield-Hazlehurst association: Moderately well drained and somewhat poorly drained soils that have a sandy surface layer and loamy underlying layers; mainly on smooth uplands
5 Pelham-Leefield-Olustee association: Poorly drained and somewhat poorly drained soils that have a sandy surface layer and loamy to sandy underlying layers; on low uplands
6 Wahee-Coxville association: Somewhat poorly drained and poorly drained soils that have a loamy surface layer and chiefly clayey underlying layers; on river terraces
7 Johnston-Rains association: Very poorly drained and poorly drained soils that have a loamy surface layer and loamy to sandy underlying layers; mainly along drainageways and in depressions
Compiled 1972
Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.
N
MONTGOMERY COUNTY
TOOMBS COUNTY
TATTNALL COUNTY
WHEELER COUNTY
TELFAIR COUNTY
COFFEE COUNTY
WAYNE COUNTY
BACON COUNTY
PIERCE COUNTY
JEFF DAVIS
APPLING
ALTAMAHA RIVER
OCMULGEE RIVER
HAZLEHURST
BAXLEY
Graham
Kirkland
Snipesville
Denton
Surrency
82°50'
82°40'
82°30'
82°20'
82°10'
31°50'
31°40'
31°30'



INDEX TO MAP SHEETS

APPLING AND JEFF DAVIS COUNTIES, GEORGIA

SOIL LEGEND

The first letter in each symbol is the initial one of the soil name. If the third letter is a capital it shows the range of slope, from A, less than 2 percent, to D, up to 12 percent. Symbols without a slope letter are those of nearly level soils. Soils that are named as eroded have a final number, 2, in their symbol.

SYMBOL	NAME
Ad	Albany sand
Bf	Bayboro loam
CnB	Carnegie loamy sand, 2 to 5 percent slopes
CnC	Carnegie loamy sand, 5 to 8 percent slopes
CqB	Cowarts loamy sand, 2 to 5 percent slopes
CqC	Cowarts loamy sand, 5 to 8 percent slopes
Cv	Coxville loam
CX	Cahaba loamy sand
DvB	Dunbar loamy sand, 2 to 5 percent slopes
DvD	Dunbar loamy sand, 5 to 12 percent slopes
DwB	Duplin loamy sand, 2 to 5 percent slopes
DwC	Duplin loamy sand, 5 to 8 percent slopes
FsB	Fuquay loamy sand, 0 to 5 percent slopes
Hi	Hazlehurst loamy sand
Ij	Irvington loamy sand
Jc	Johns sandy loam
Jd	Johnston and Rains soils
KdC	Kershaw sand, 2 to 8 percent slopes
LL	Leefield soils
Ls	Leefield loamy sand
Mn	Mascotte sand
NhA	Norfolk loamy sand, 0 to 2 percent slopes
NhB	Norfolk loamy sand, 2 to 5 percent slopes
Oa	Olustee sand
Pl	Pelham loamy sand
ShD2	Sunsweet sandy loam, 5 to 12 percent slopes, eroded
Sv	Surrency loamy sand
TpB	Troup sand, 0 to 5 percent slopes
TqA	Tifton loamy sand, 0 to 2 percent slopes
TqB	Tifton loamy sand, 2 to 5 percent slopes
TWD	Troup-Wicksburg complex, 8 to 12 percent slopes
WvC	Wicksburg gravelly coarse sand, 2 to 8 percent slopes
WW	Wahee and Coxville soils

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Divided
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Buildings
- School
- Church

Mine and quarry

Gravel pit

Power line

Pipeline

Cemetery

Dams

Levee

Tanks

Well, oil or gas

Forest fire or lookout station

Sawmill

Located object

BOUNDARIES

- National or state
- County
- Minor civil division
- Reservation
- Land grant
- Small park, cemetery, airport
- Land survey division corners

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
- Unclassified

Canals and ditches

Lakes and ponds
- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Drainage end or alluvial fan

RELIEF

Escarpments
- Bedrock
- Other

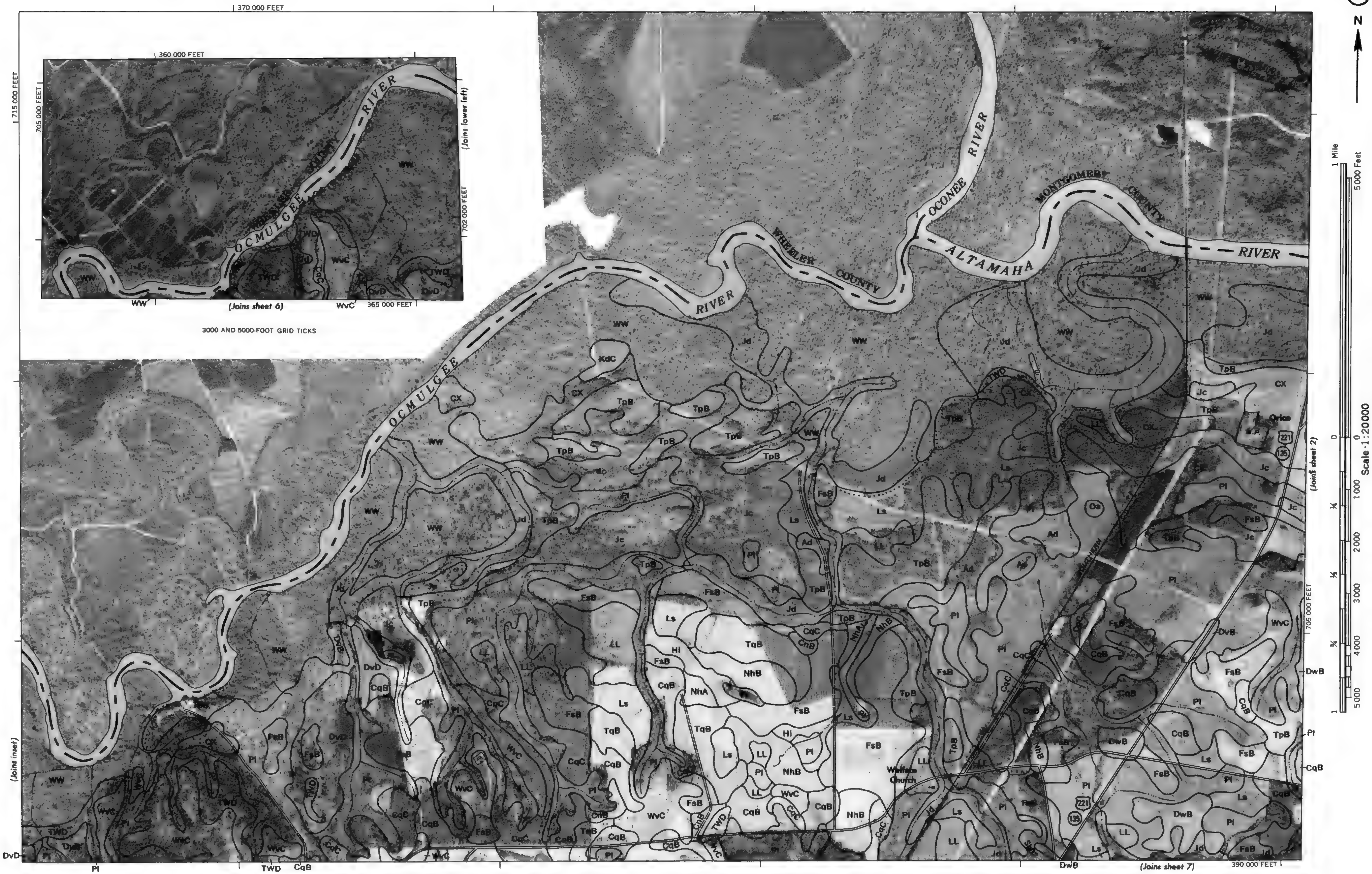
Short steep slope

Prominent peak

Depressions (Large, Small)
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stoniness: Stony; Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully
- Sandy area



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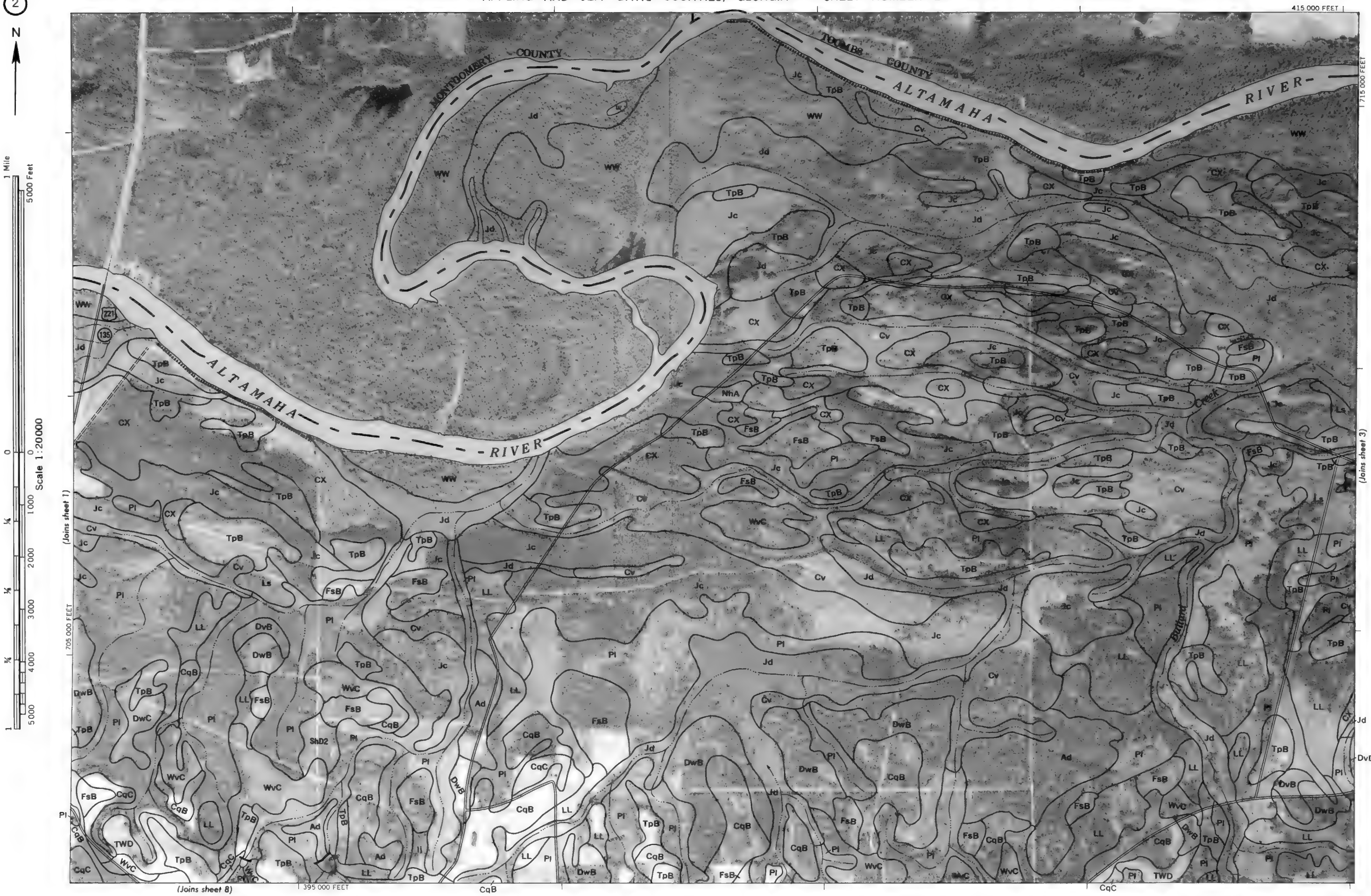
APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 2



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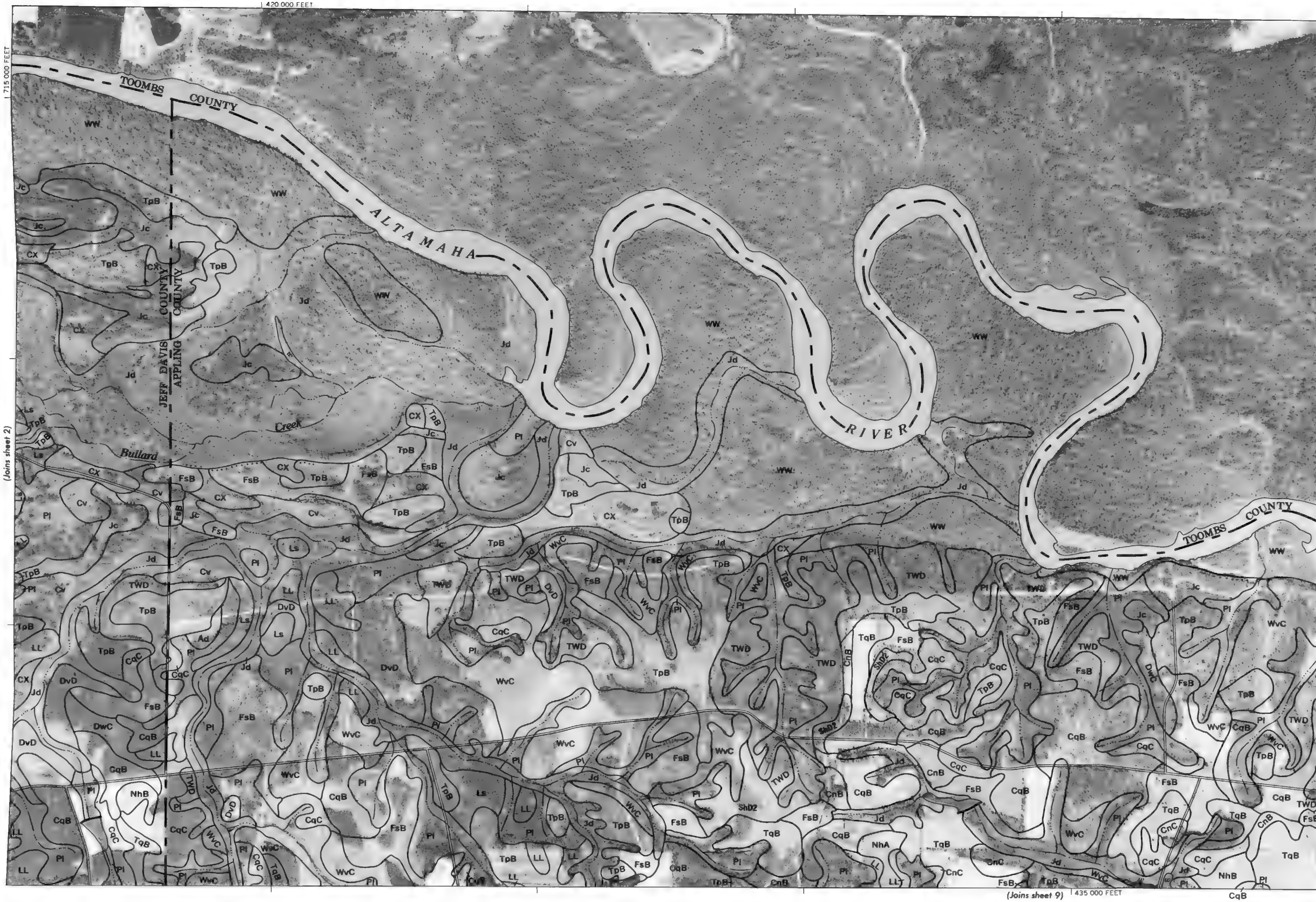

Scale 1:20000

1 Mile

0 ¼ ½ ¾ 1

5000 Feet

0 1000 2000 3000 4000 5000

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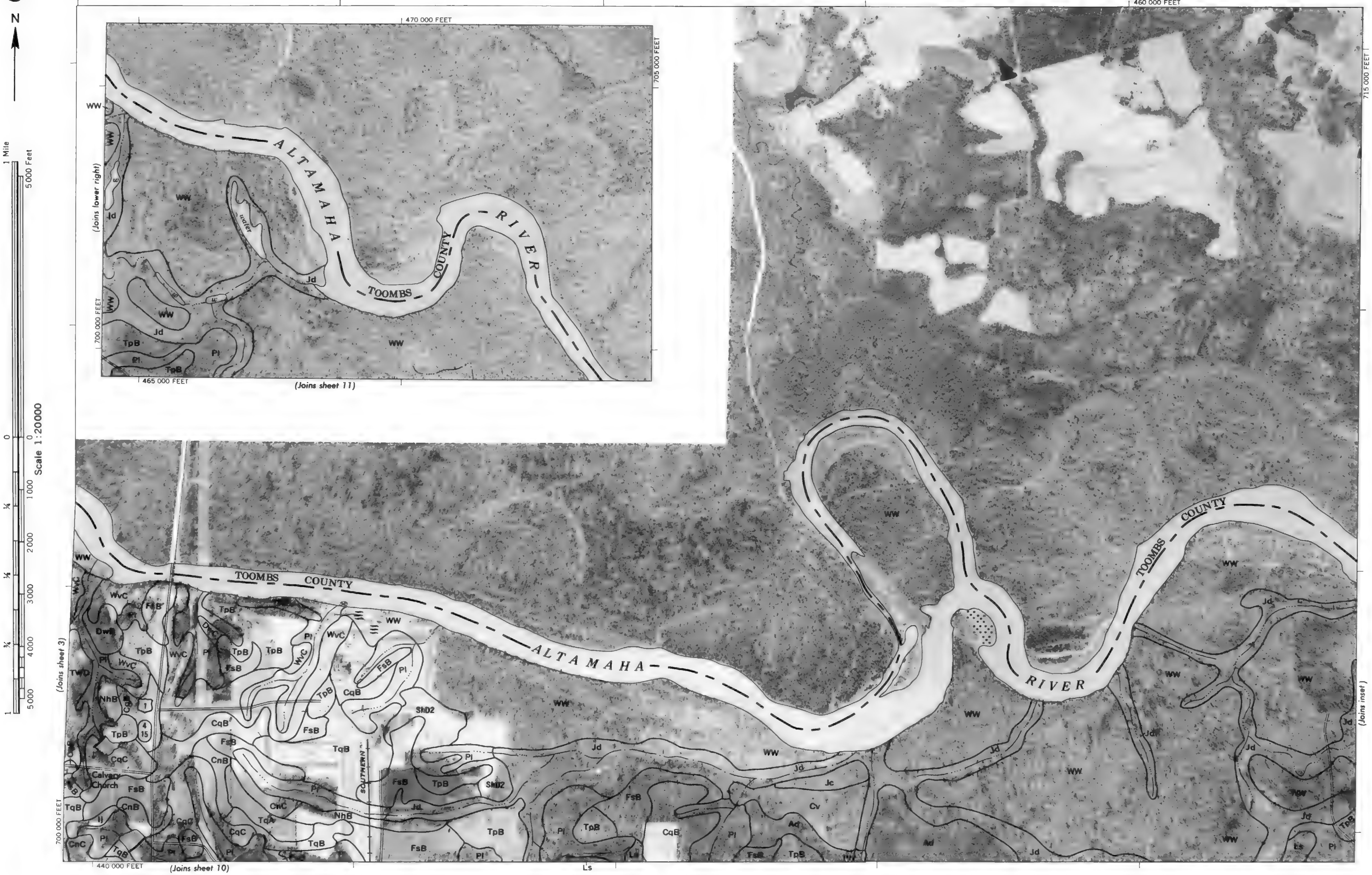

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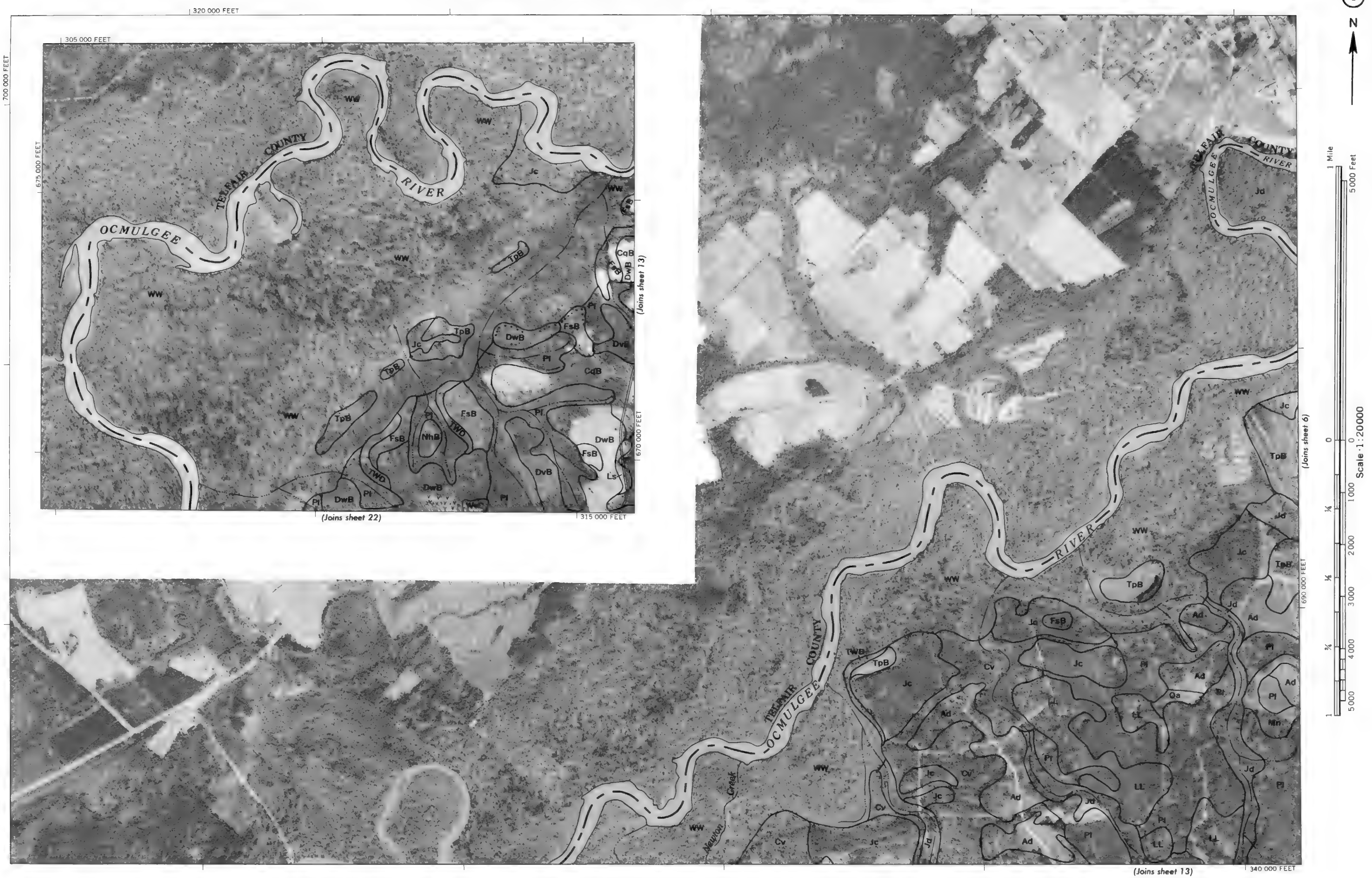

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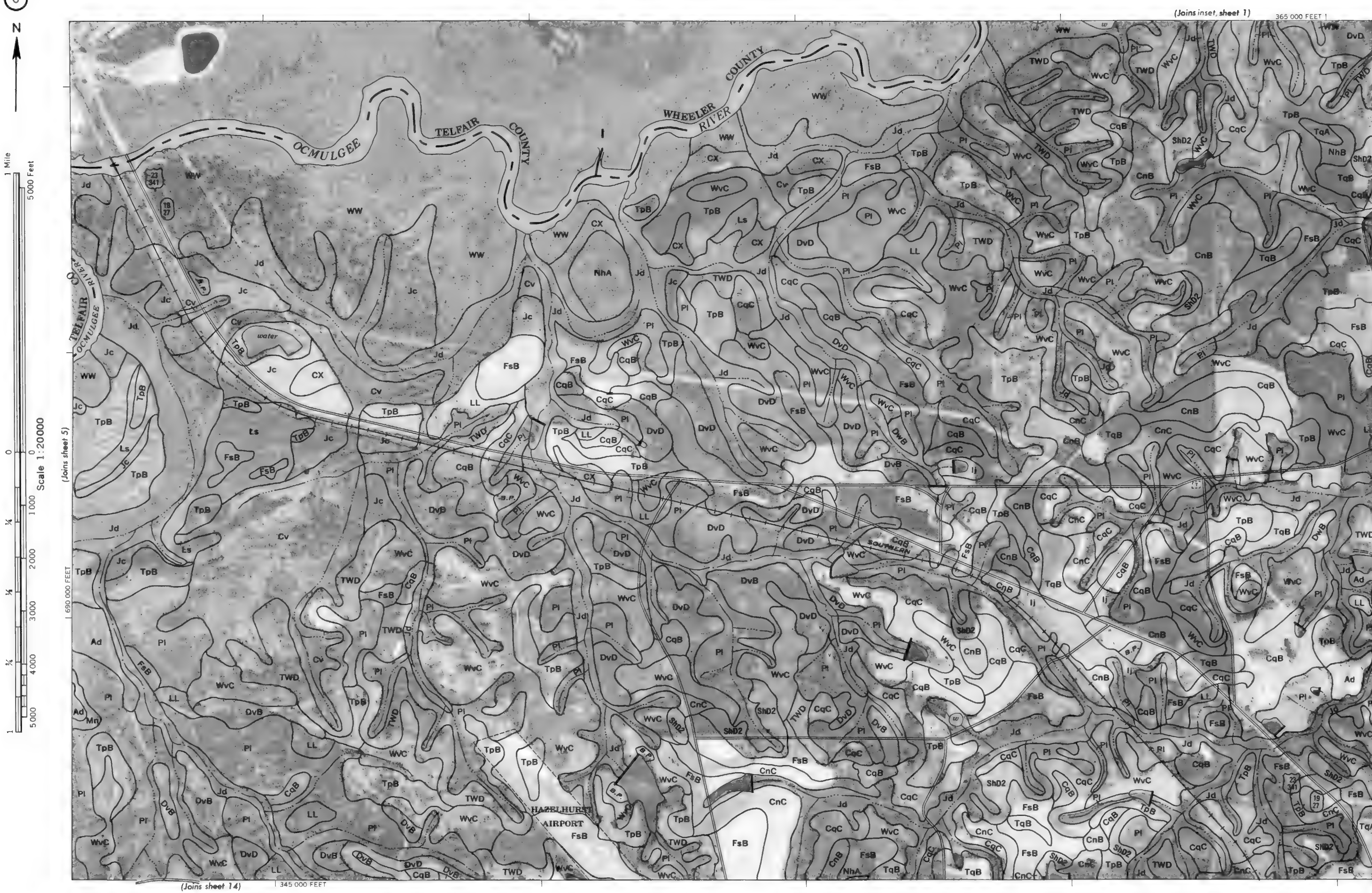

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APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 8

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APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 9

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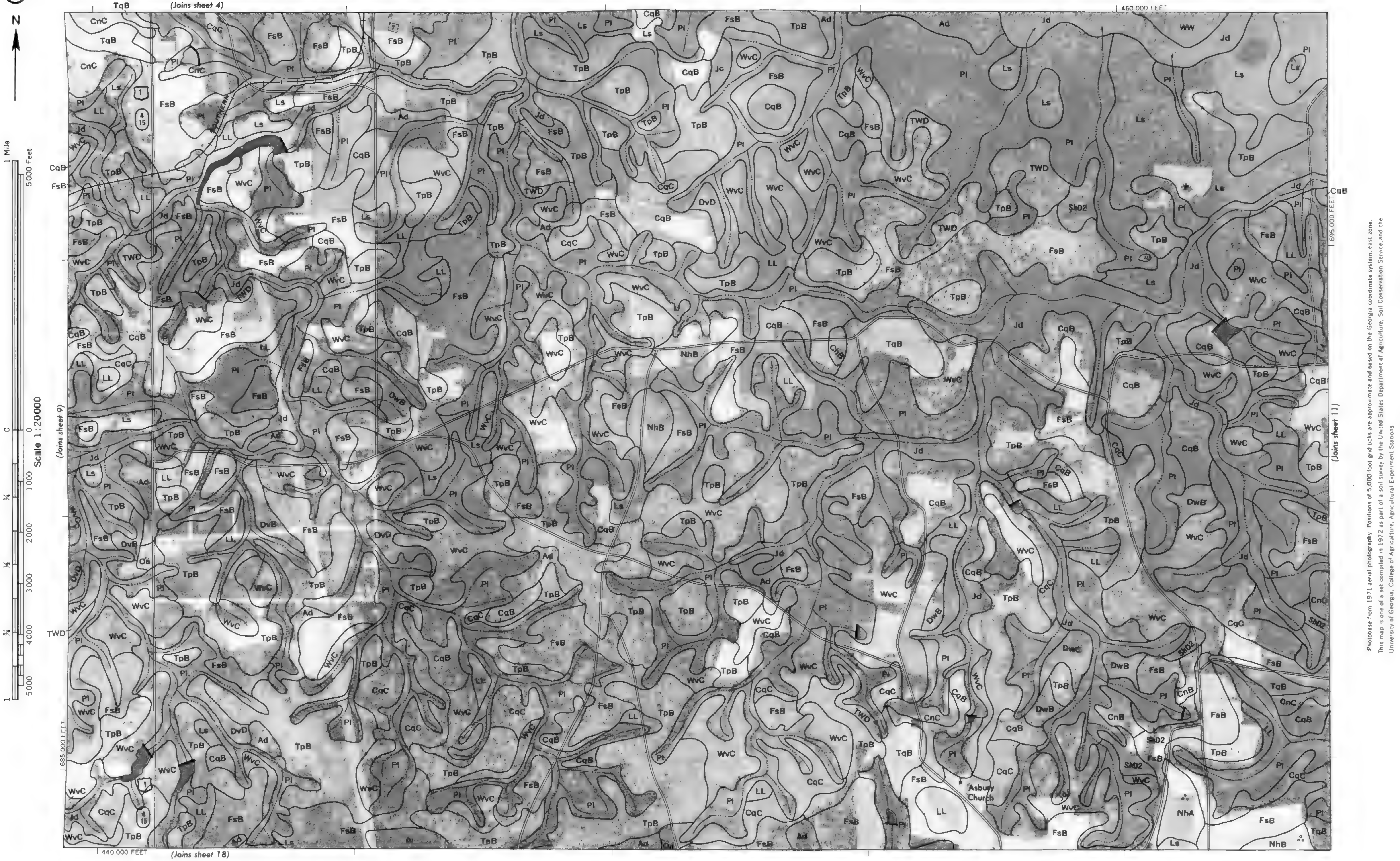
10
N
(Joins sheet 4)
(Joins sheet 9)
(Joins sheet 11)
(Joins sheet 18)
460 000 FEET
695 000 FEET
440 000 FEET
685 000 FEET
Asbury Church
1 Mile
5000 Feet
Scale 1:20000
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.
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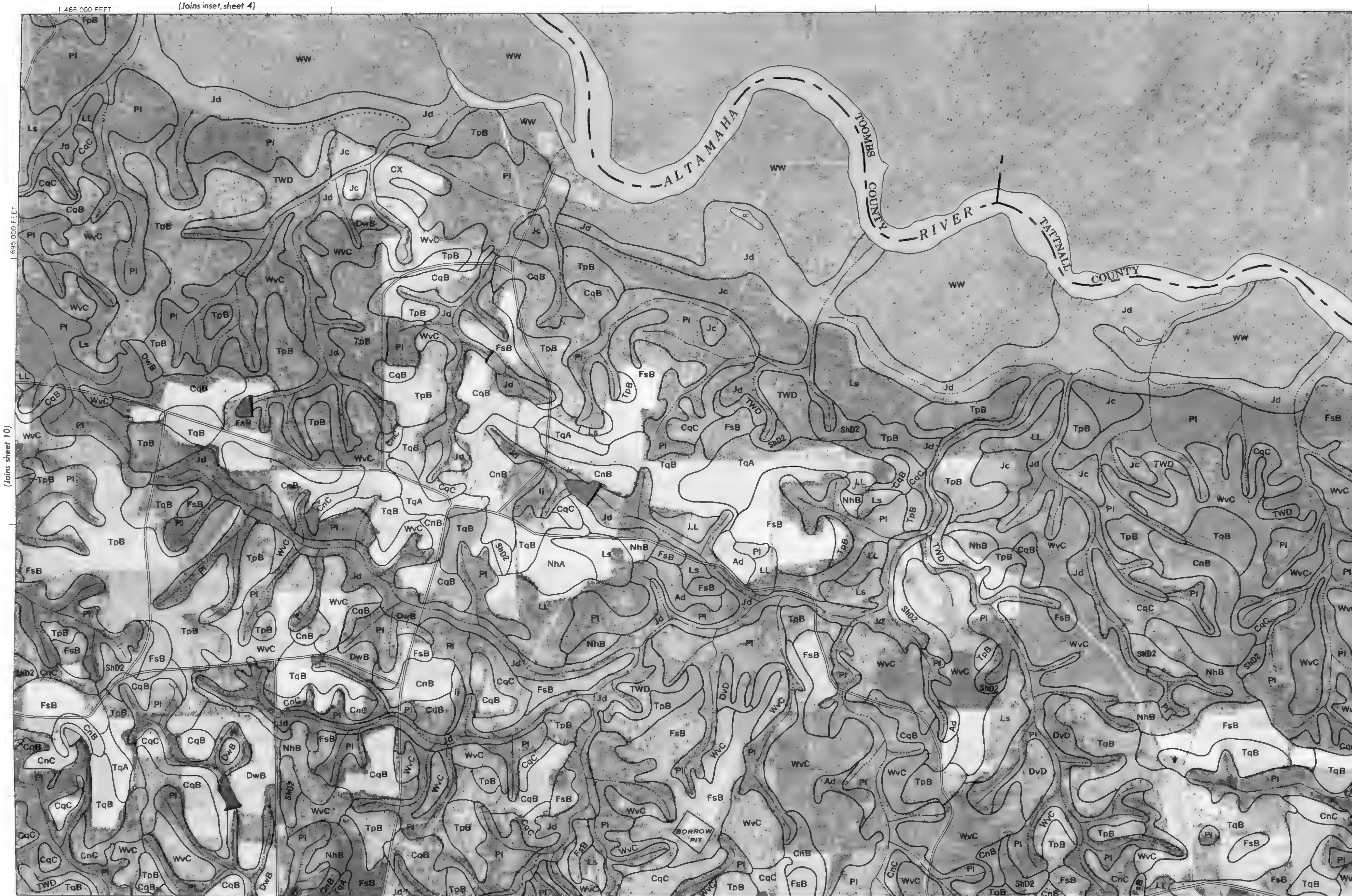


N

1 Mile
5000 Feet
Scale 1:20000
0 1000 2000 3000 4000 5000
0 ¼ ½ ¾ 1

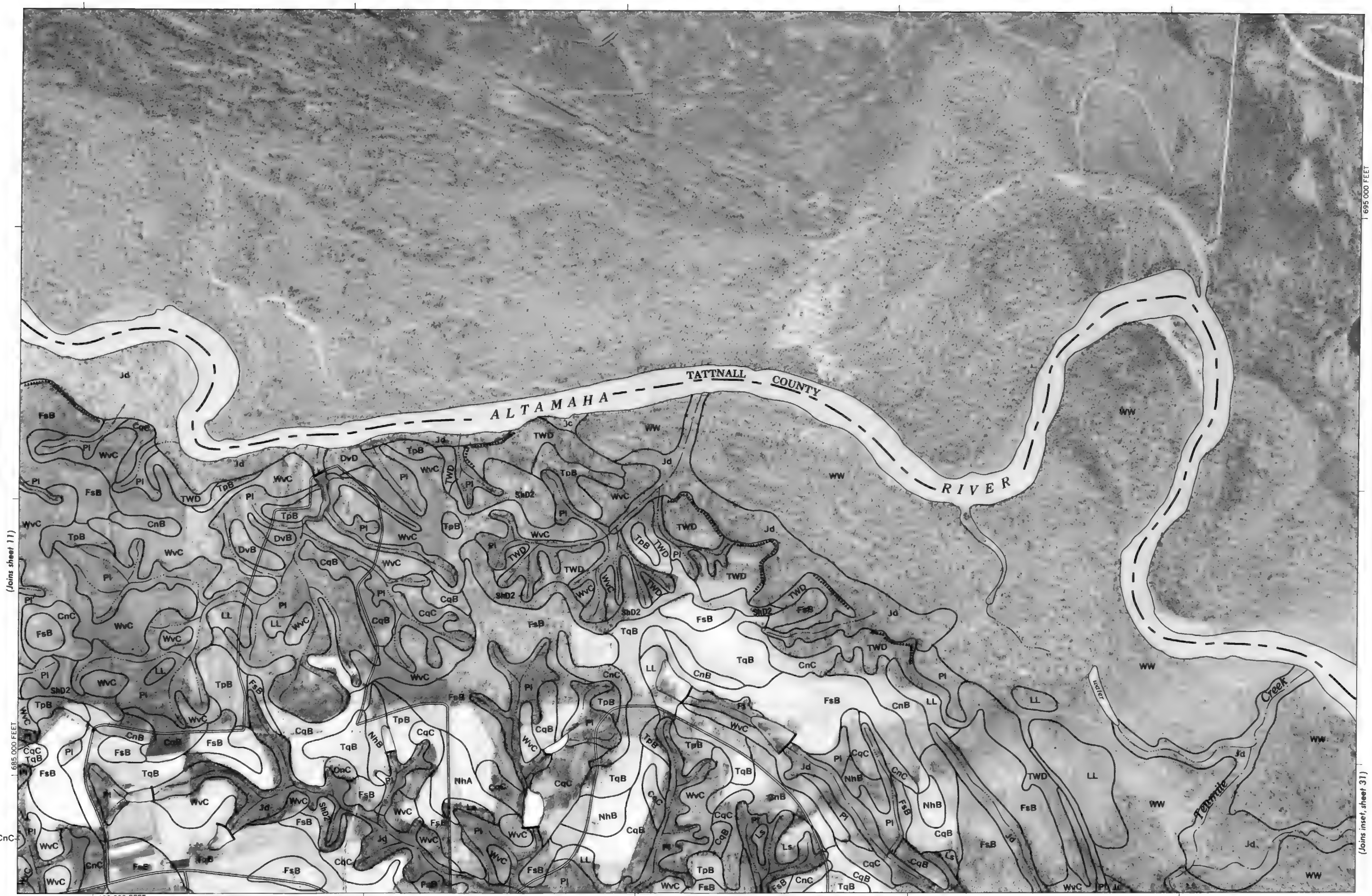
APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 12

N

Scale 1:20000

1 Mile ¾ ½ ¼ 0

5000 Feet 4000 3000 2000 1000 0



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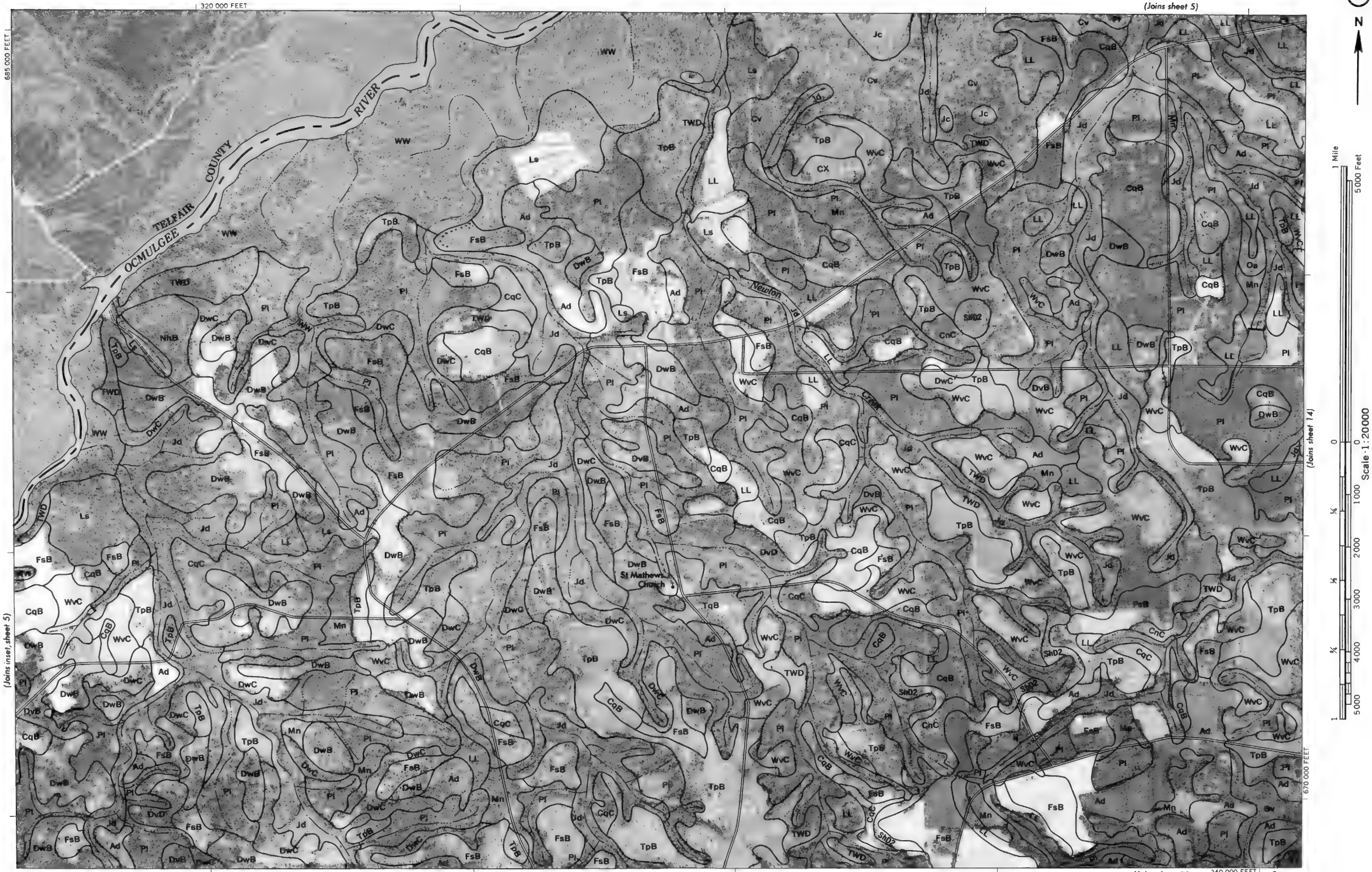
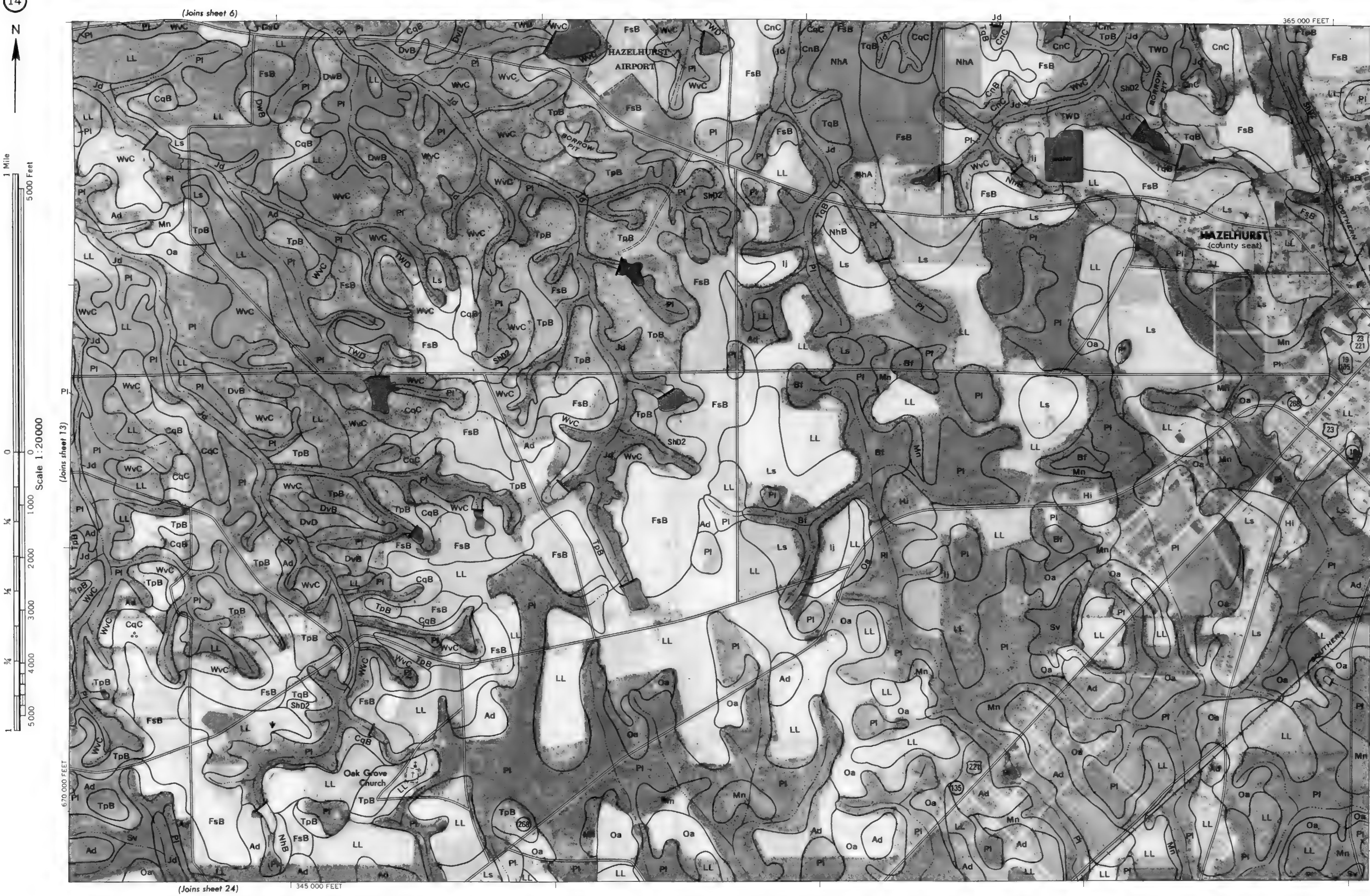


APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 14



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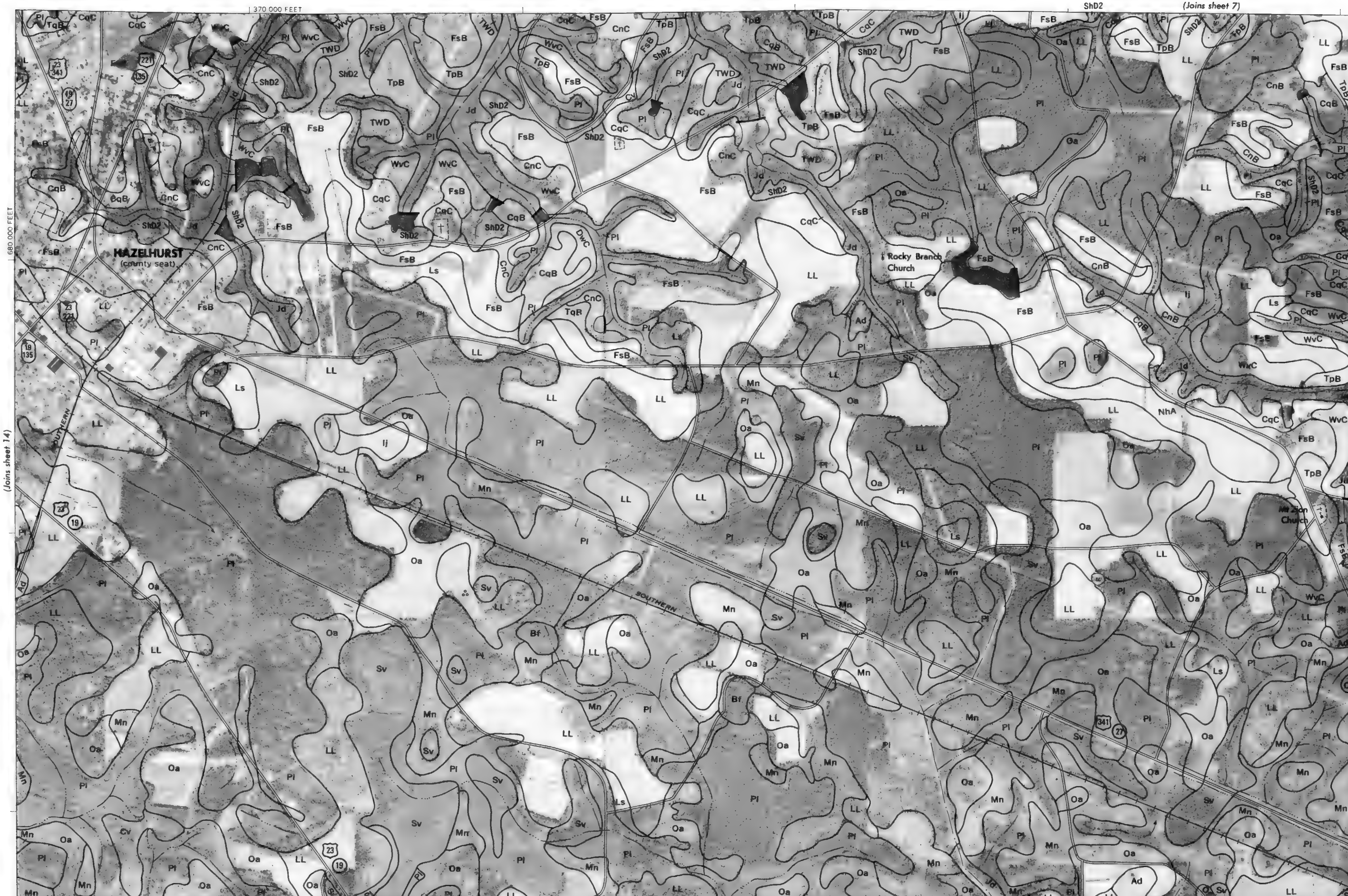
15



N

1 Mile
5000 Feet
Scale 1:20000

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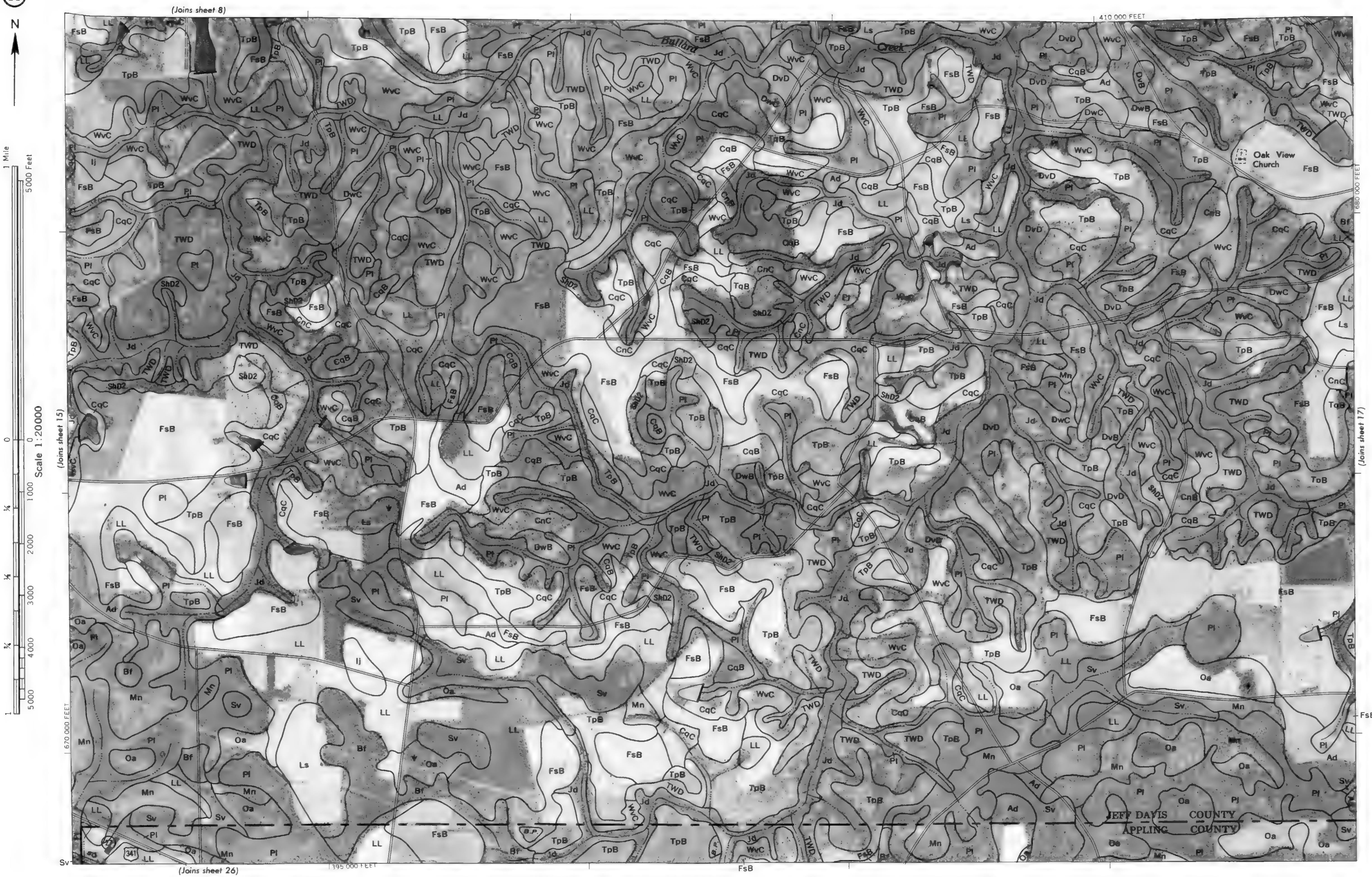
APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 16



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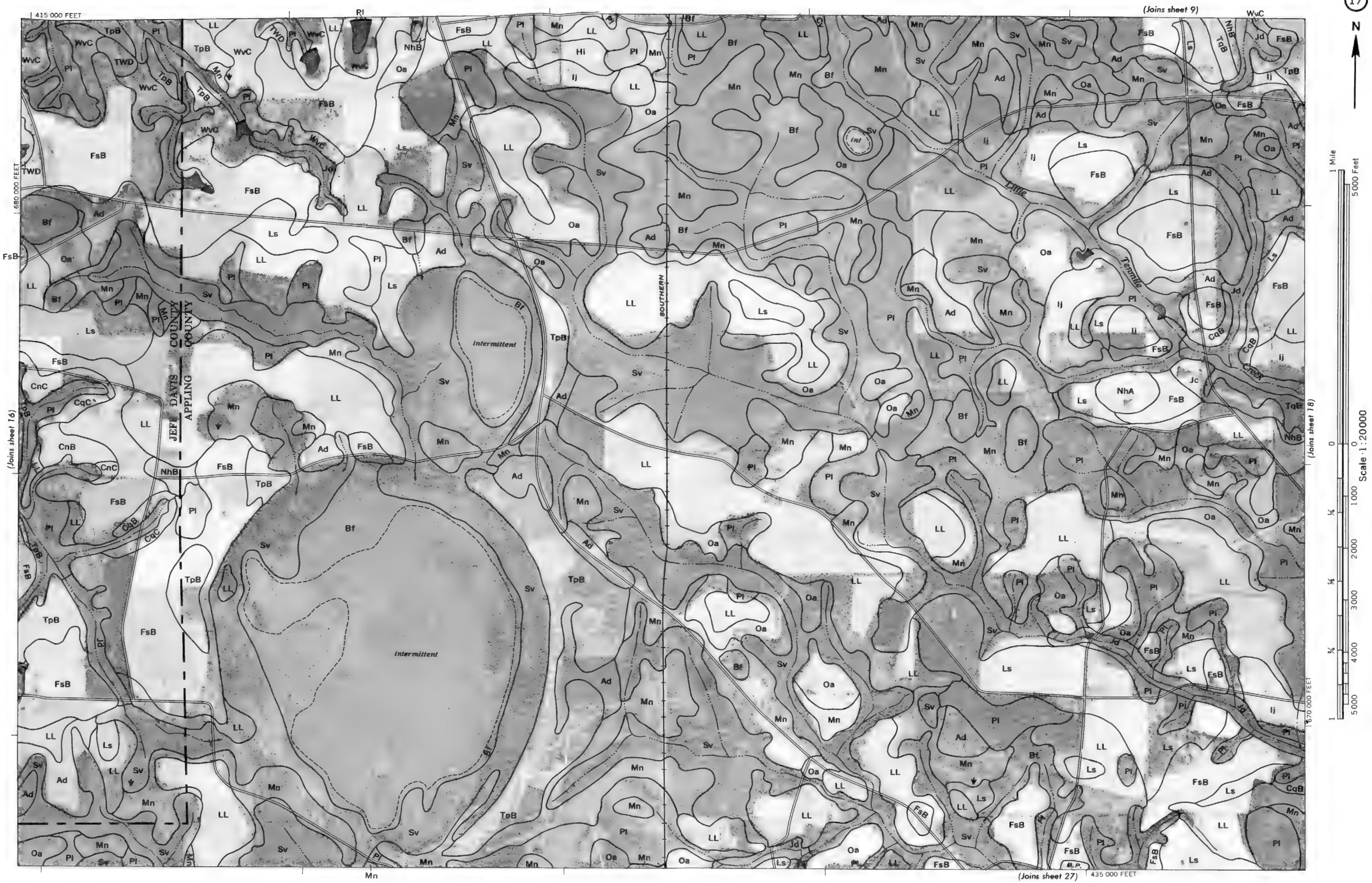

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APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 18

N

Scale 1:20000

1 Mile

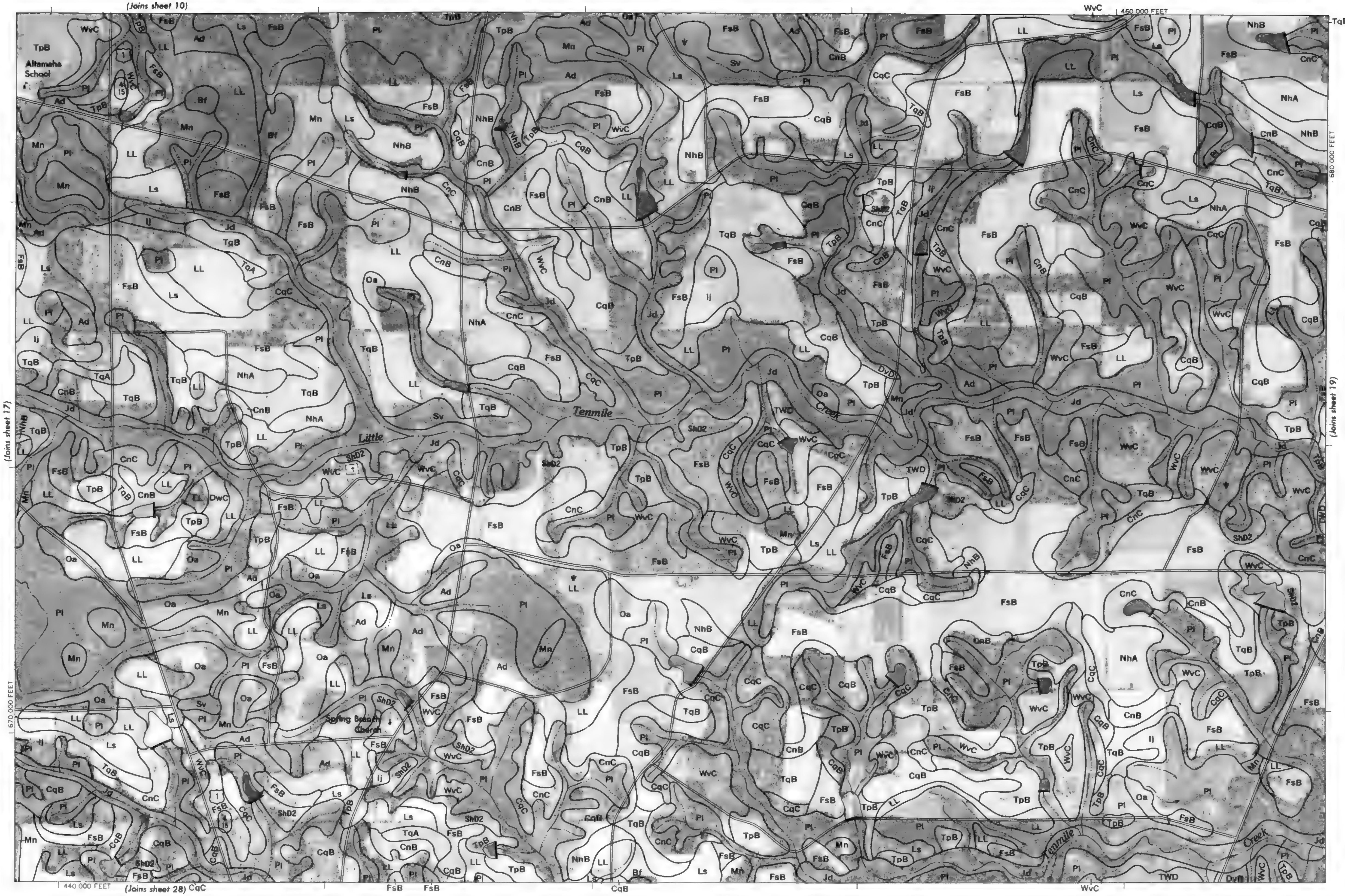
½

¼

0

5000 Feet

0 1000 2000 3000 4000 5000



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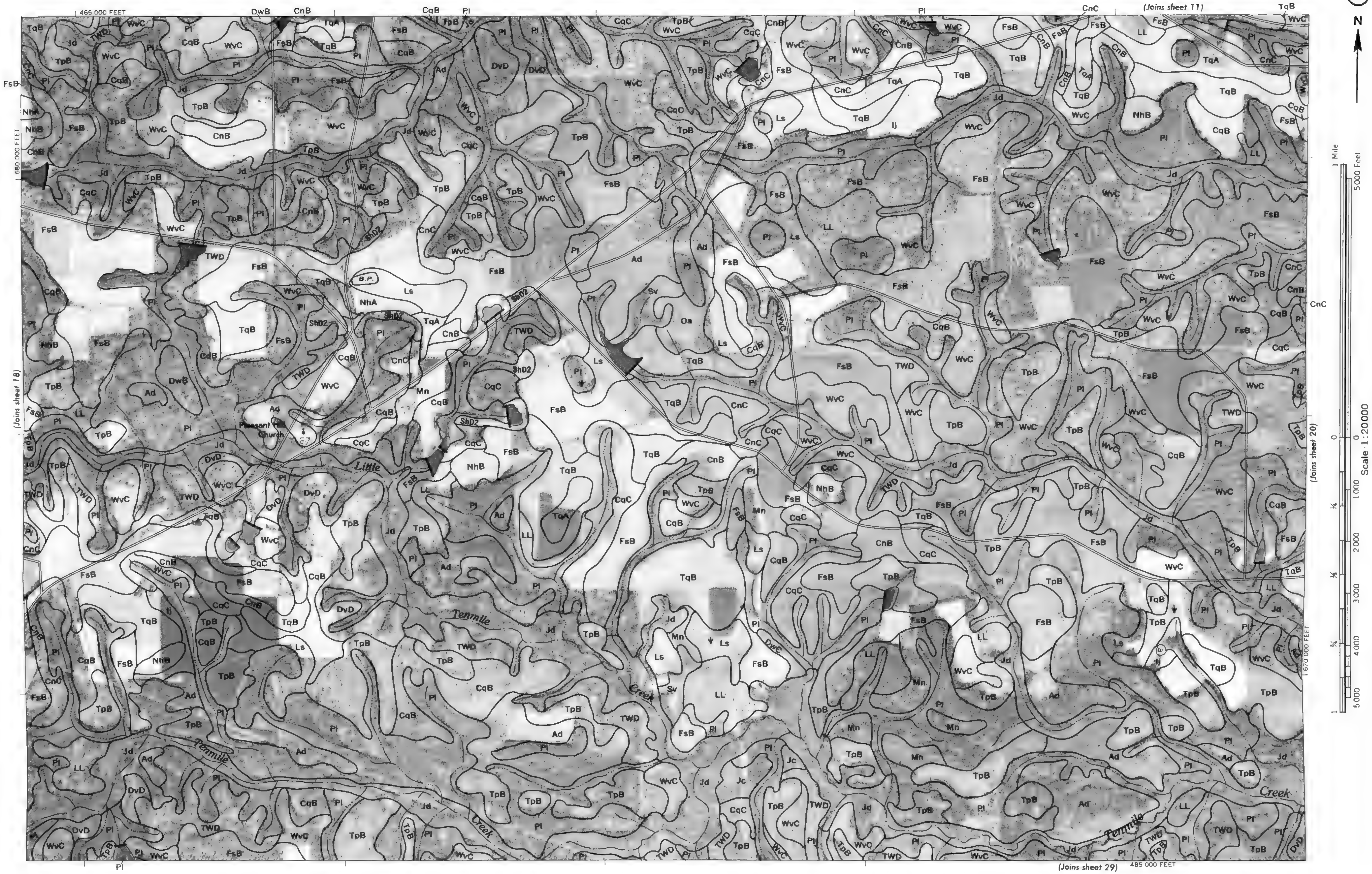

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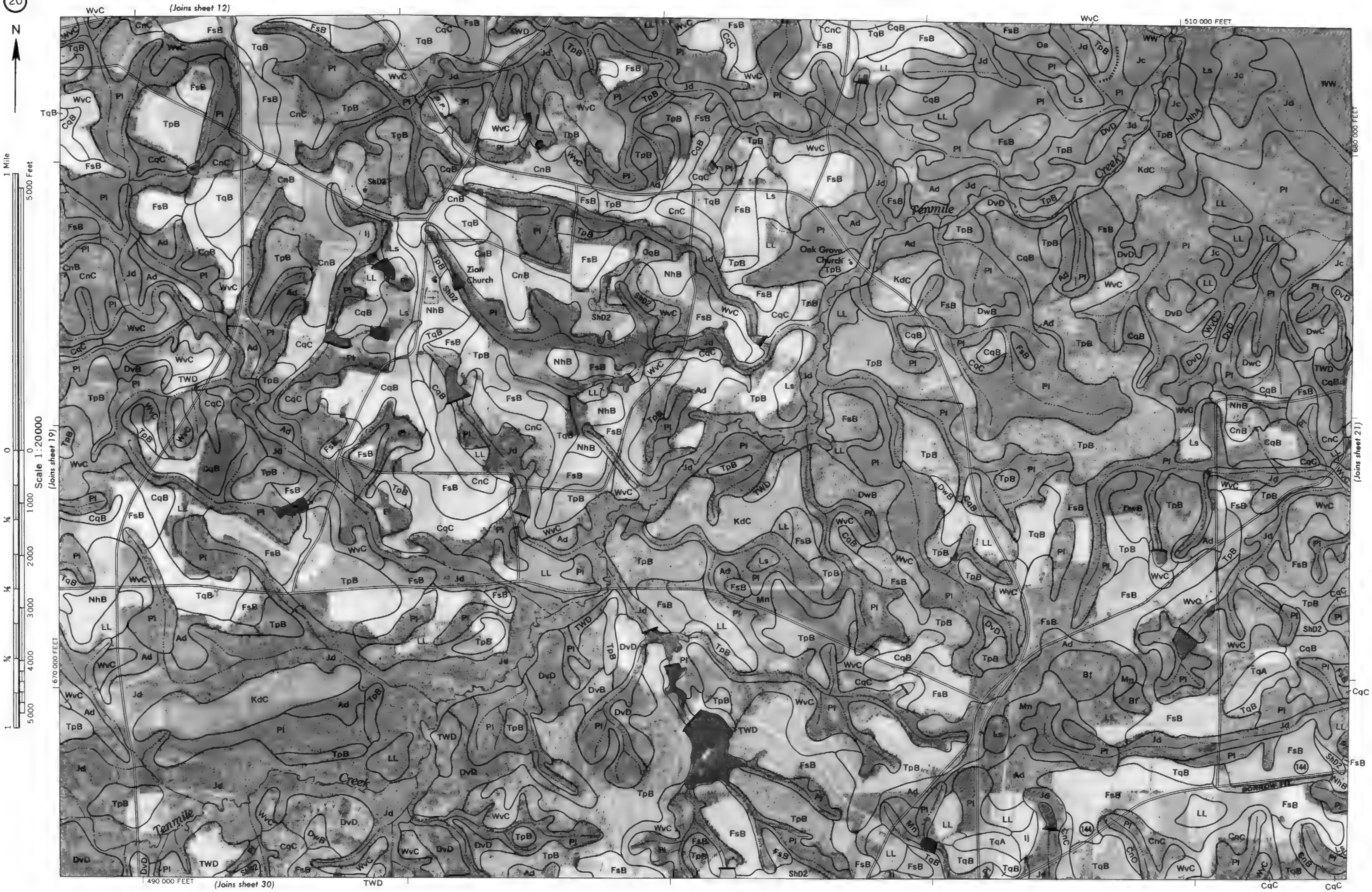

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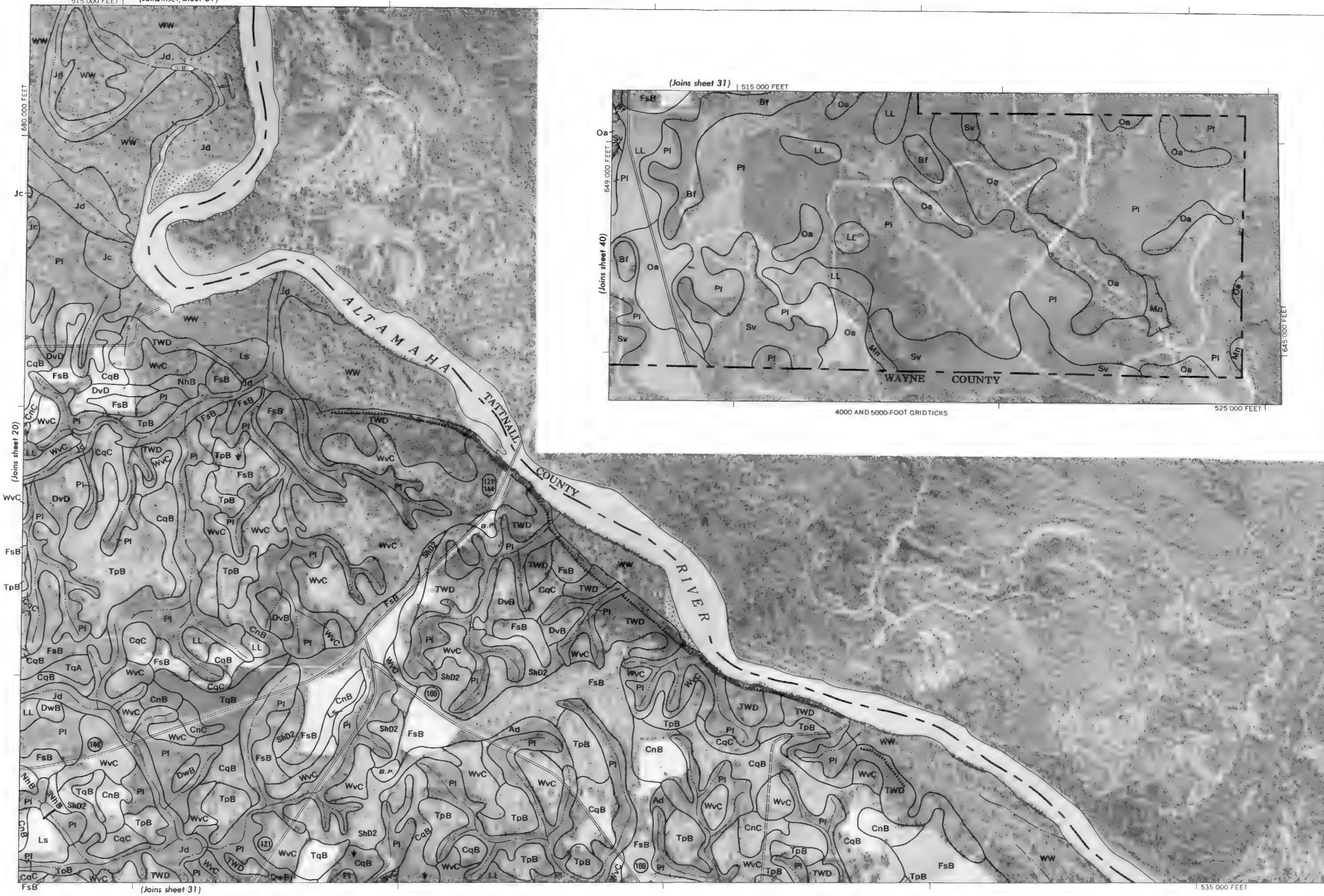

N

1 Mile
5000 Feet
0 1000 2000 3000 4000 5000
0 ¼ ½ ¾ 1
Scale 1:20000

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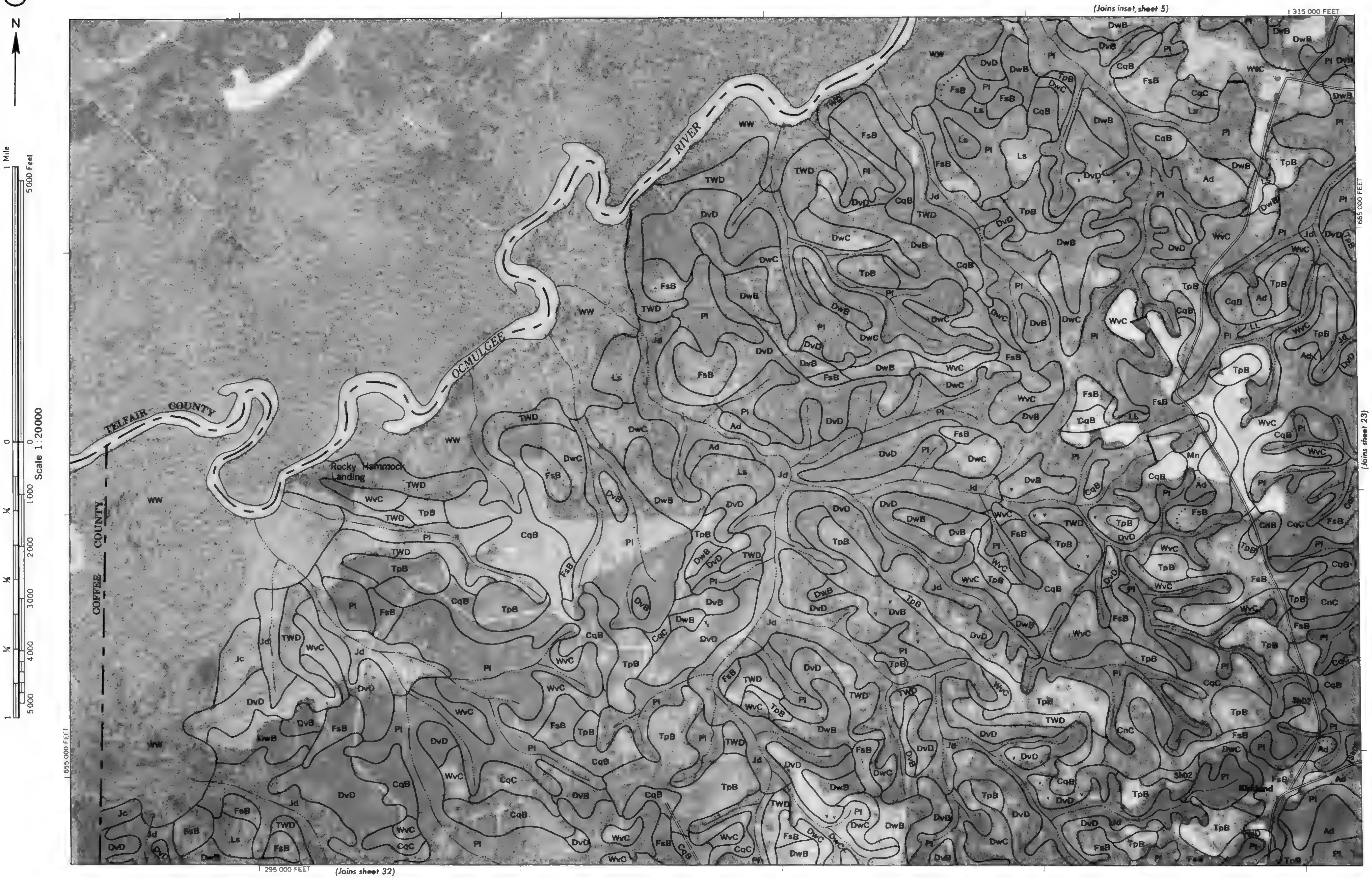

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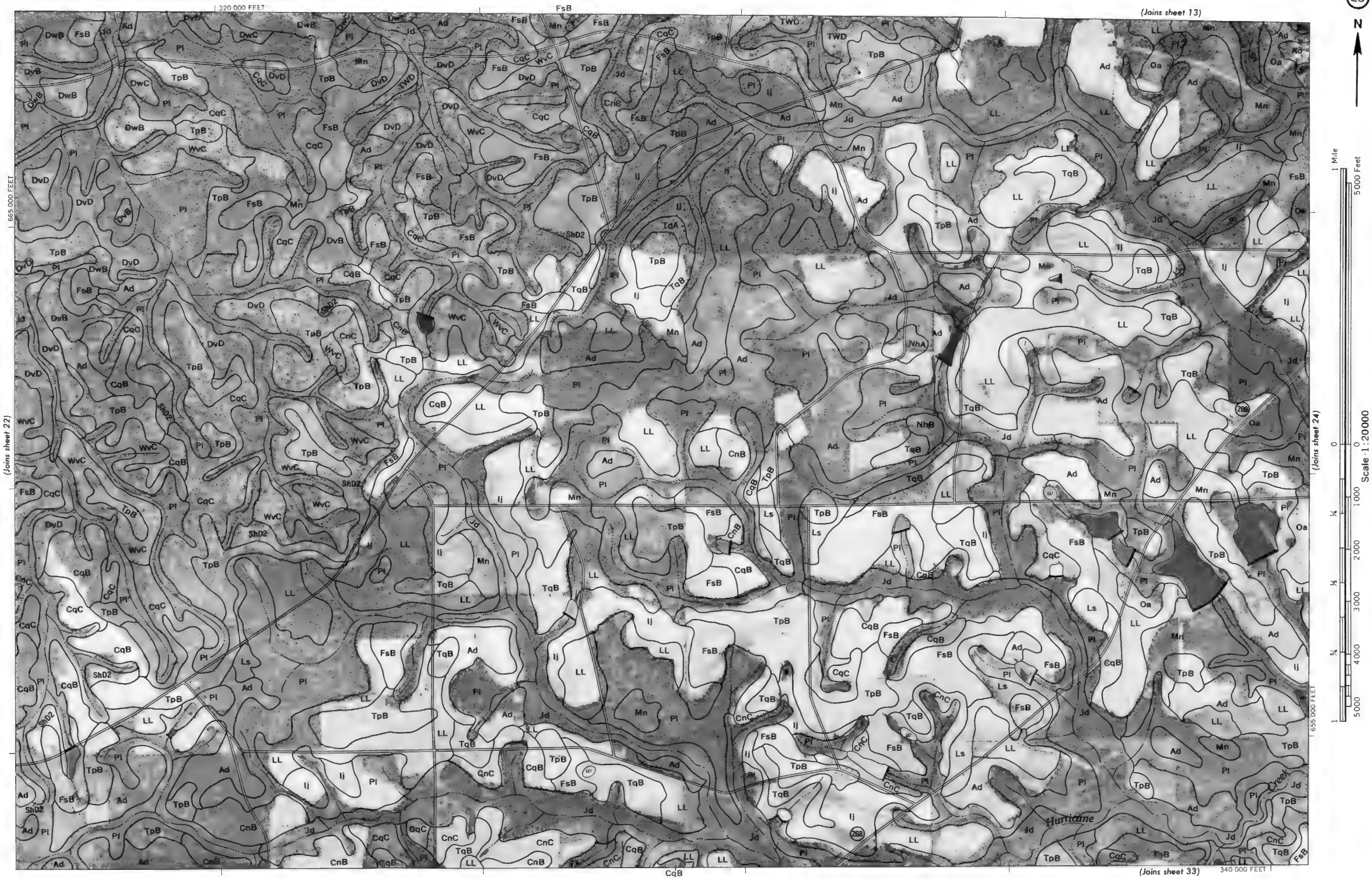
23



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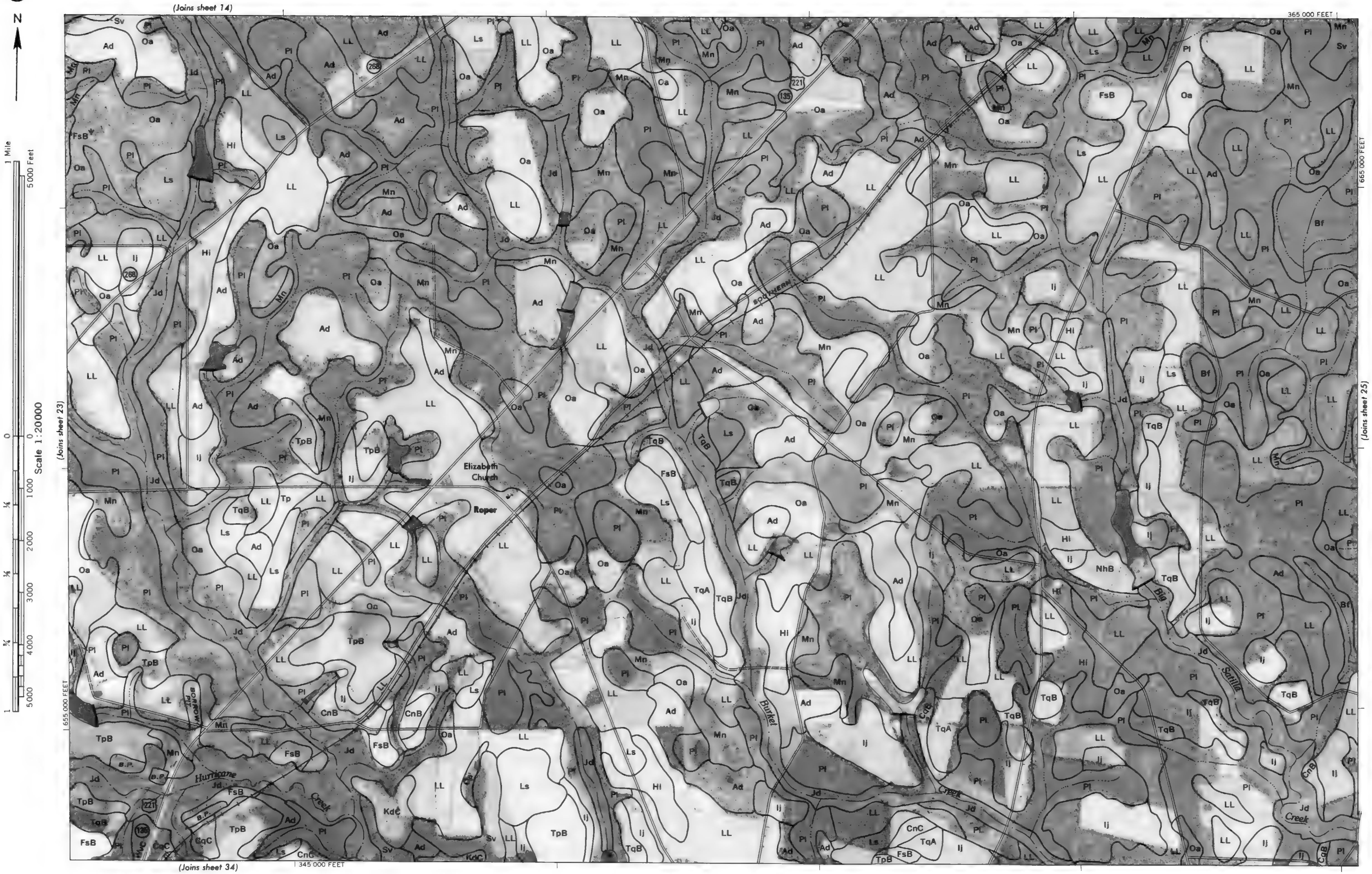
APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 24



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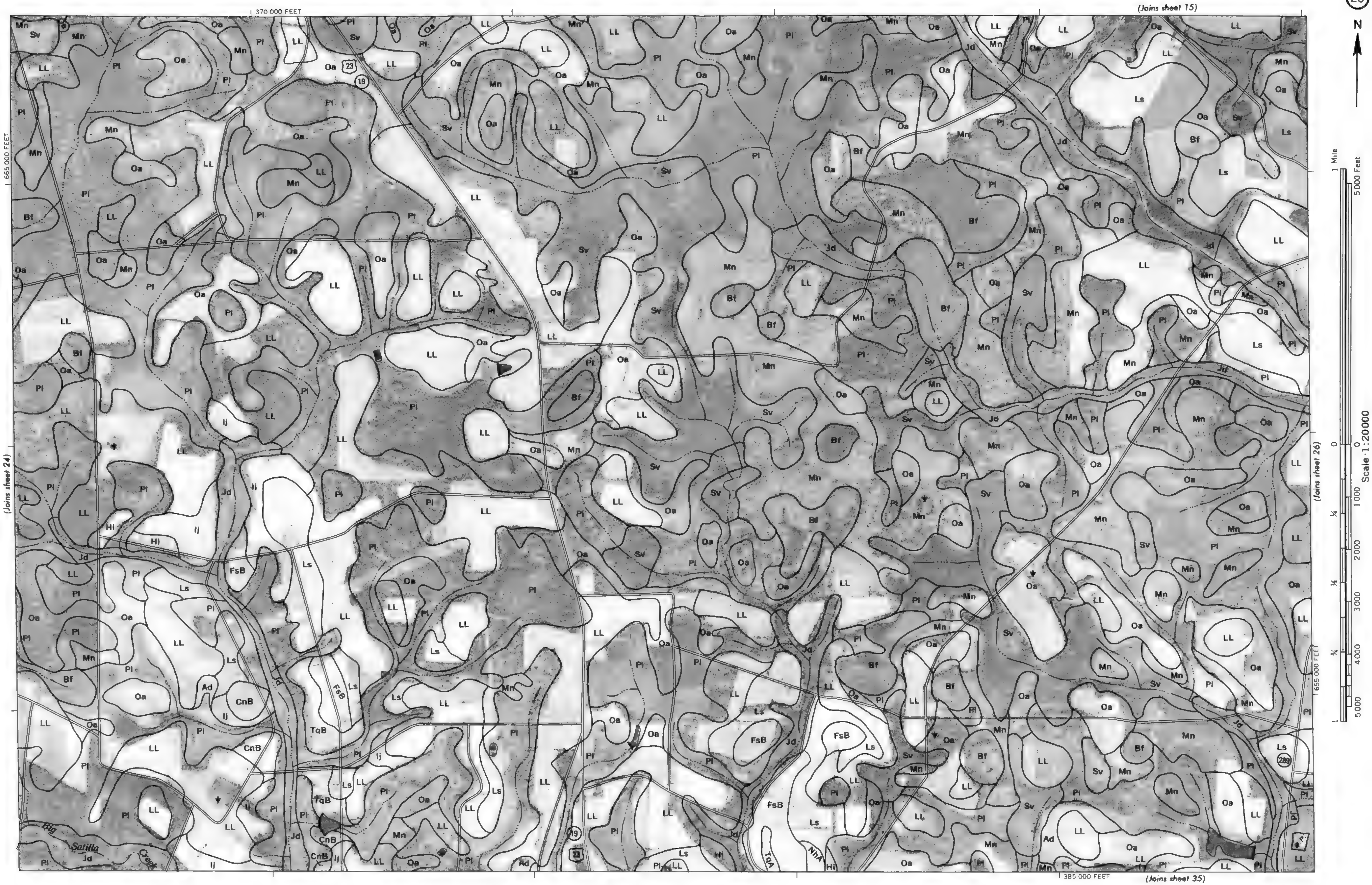

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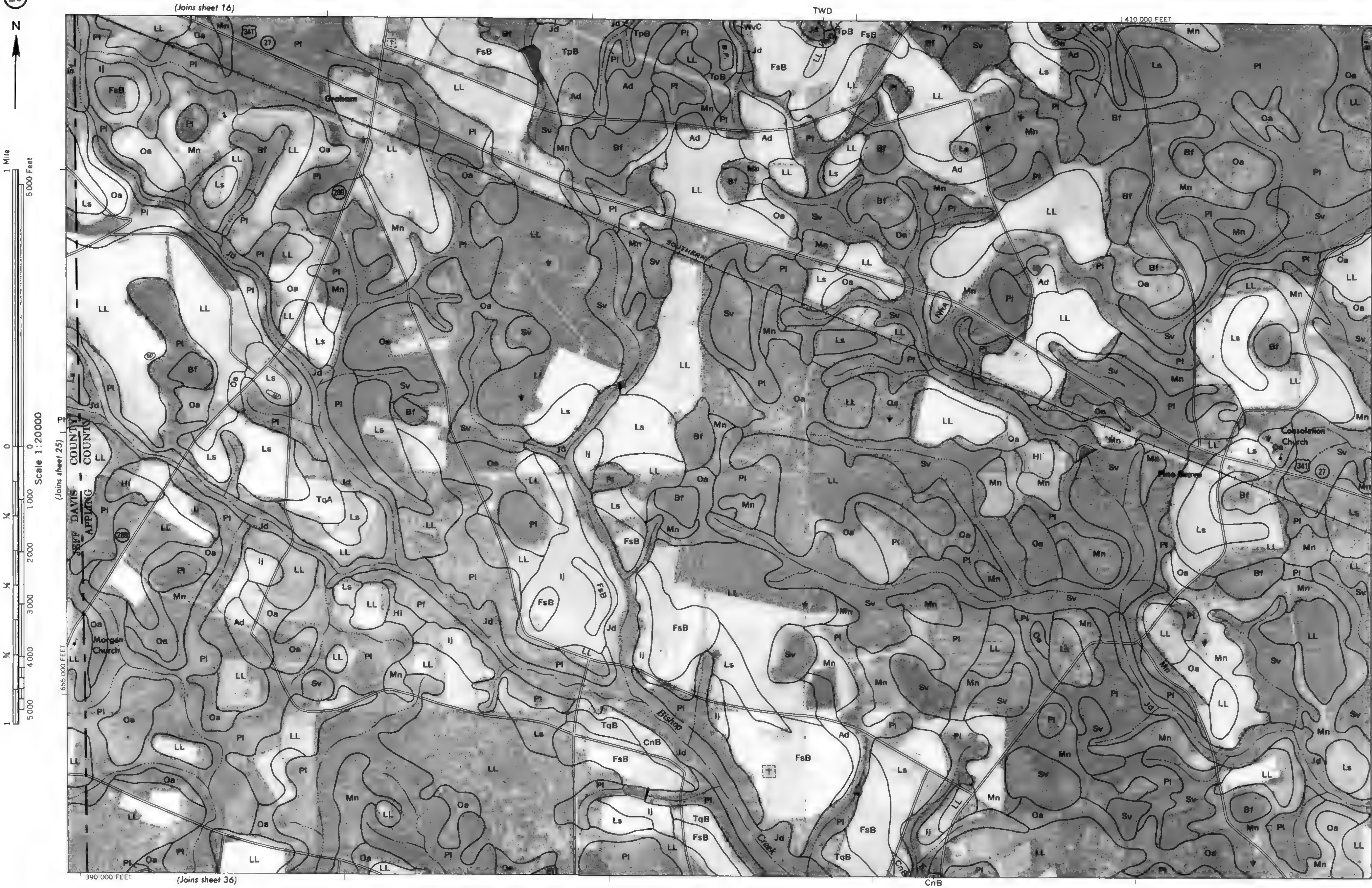
APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 26



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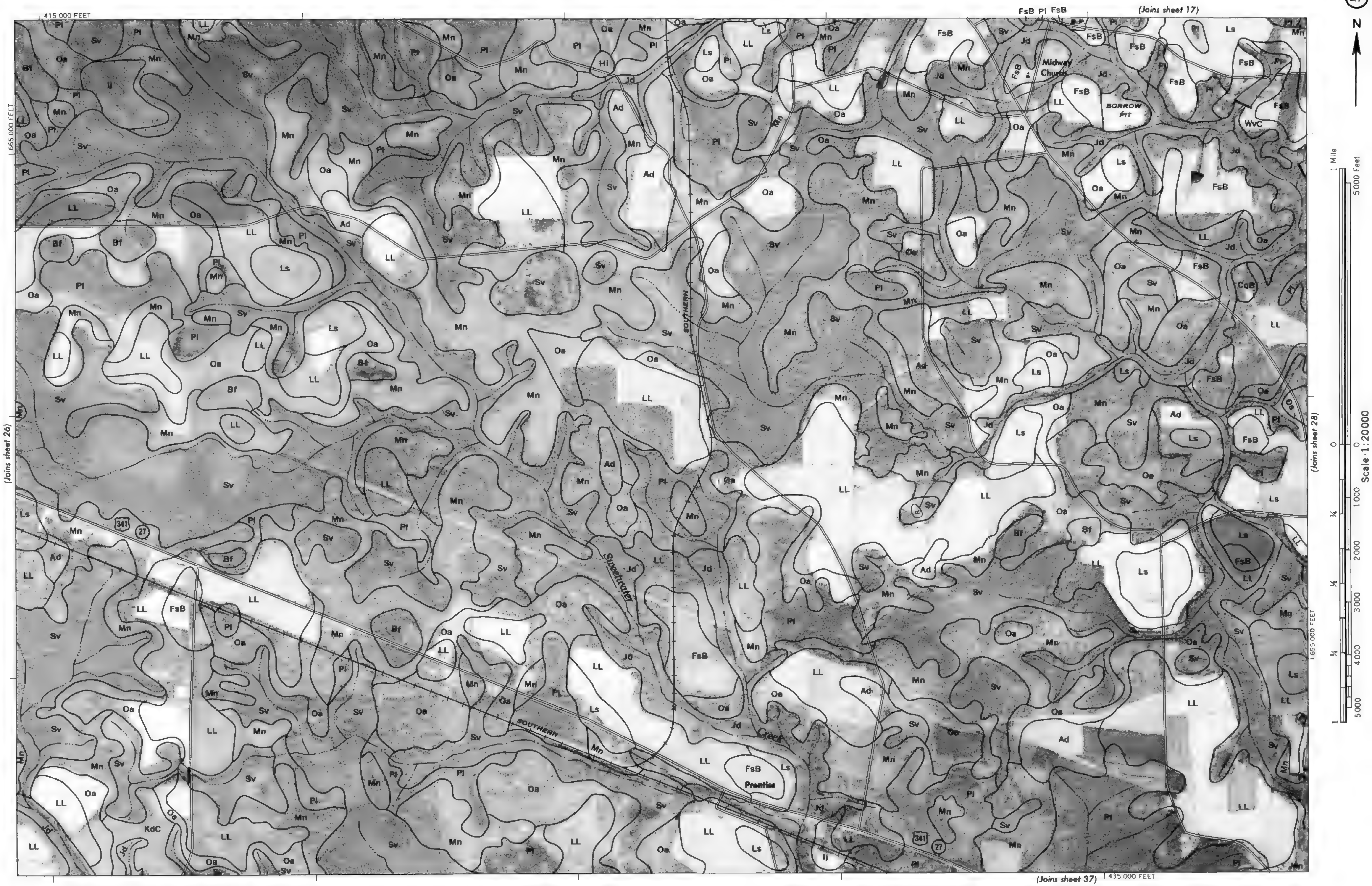

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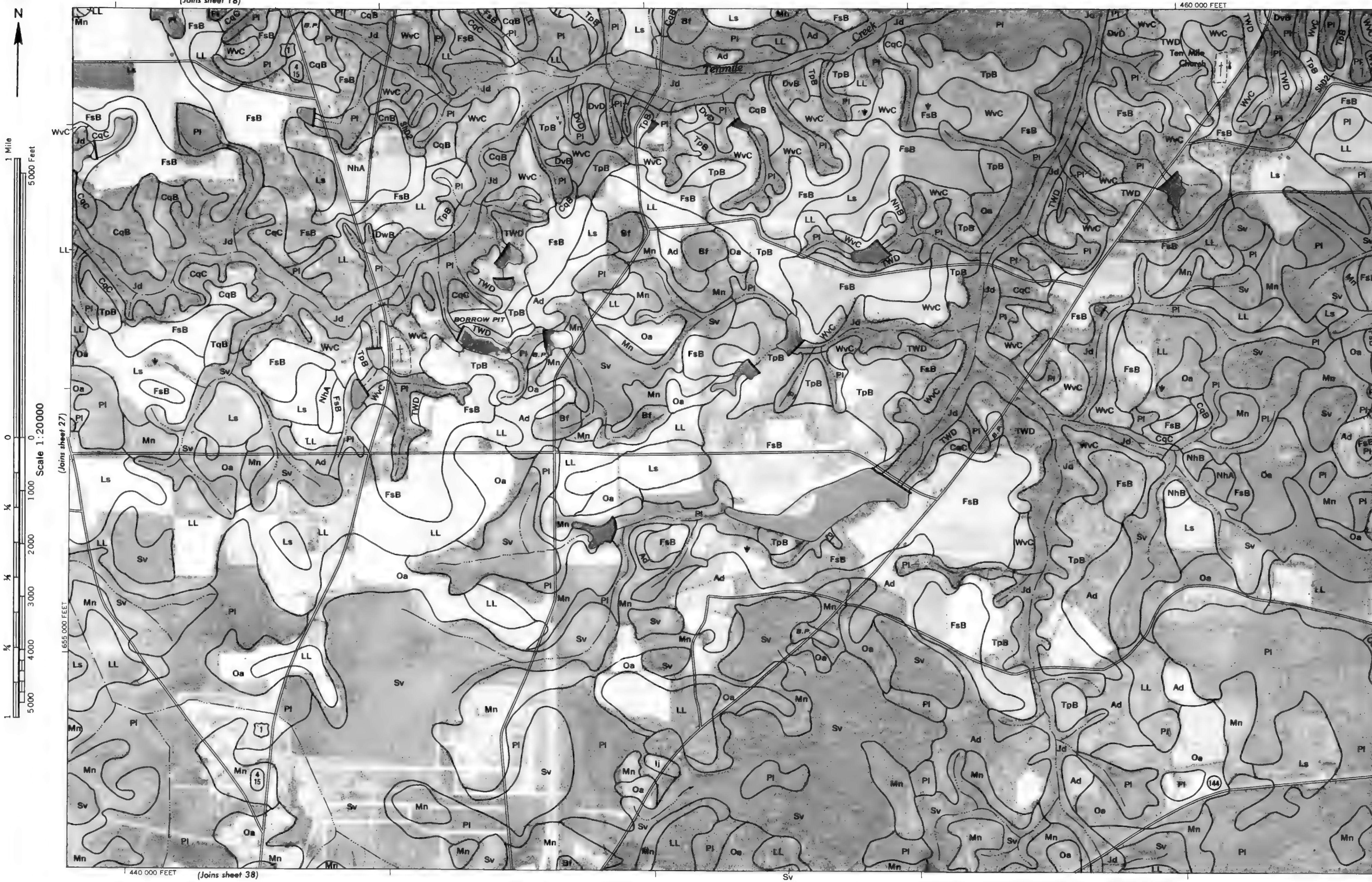

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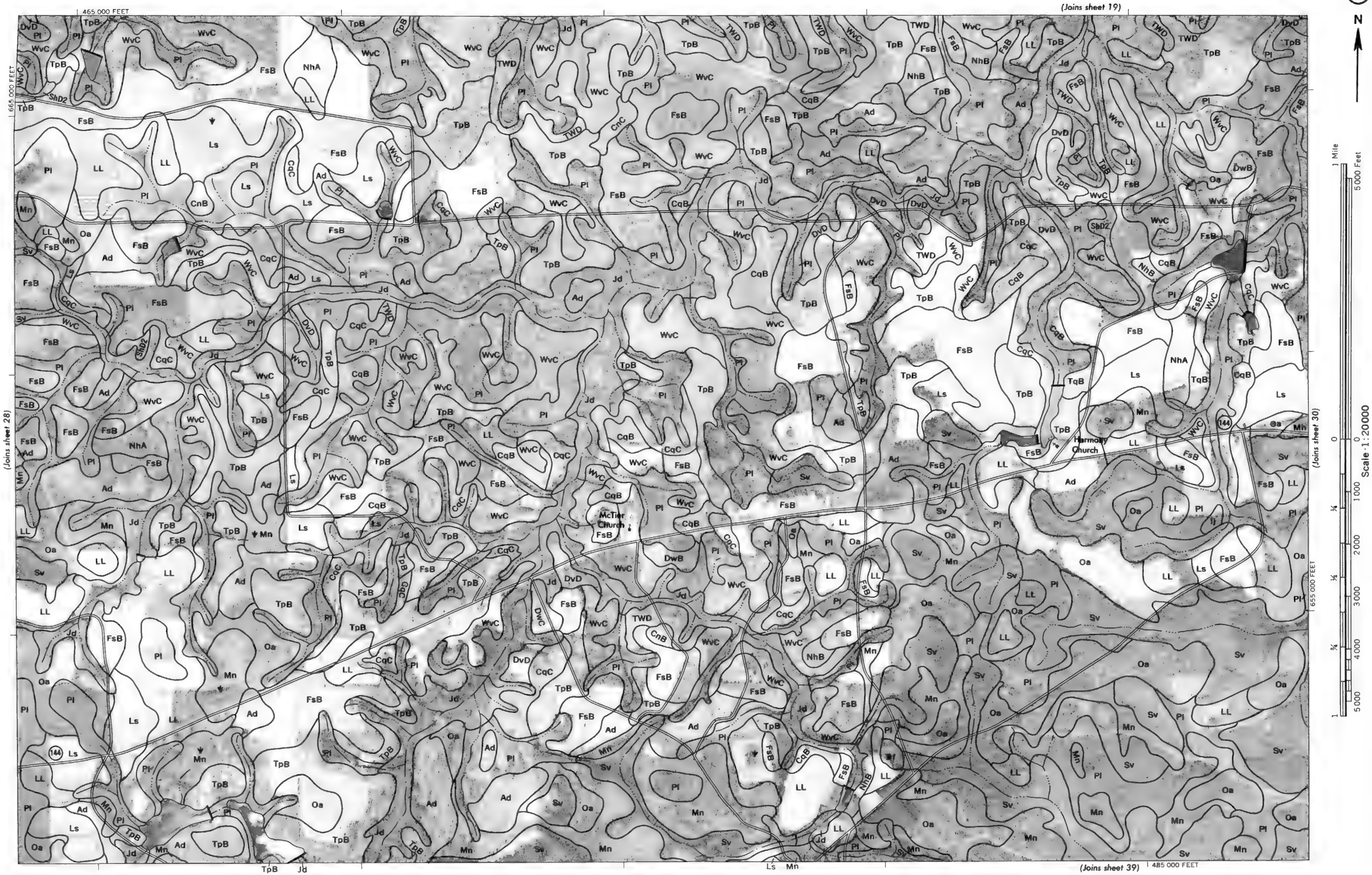

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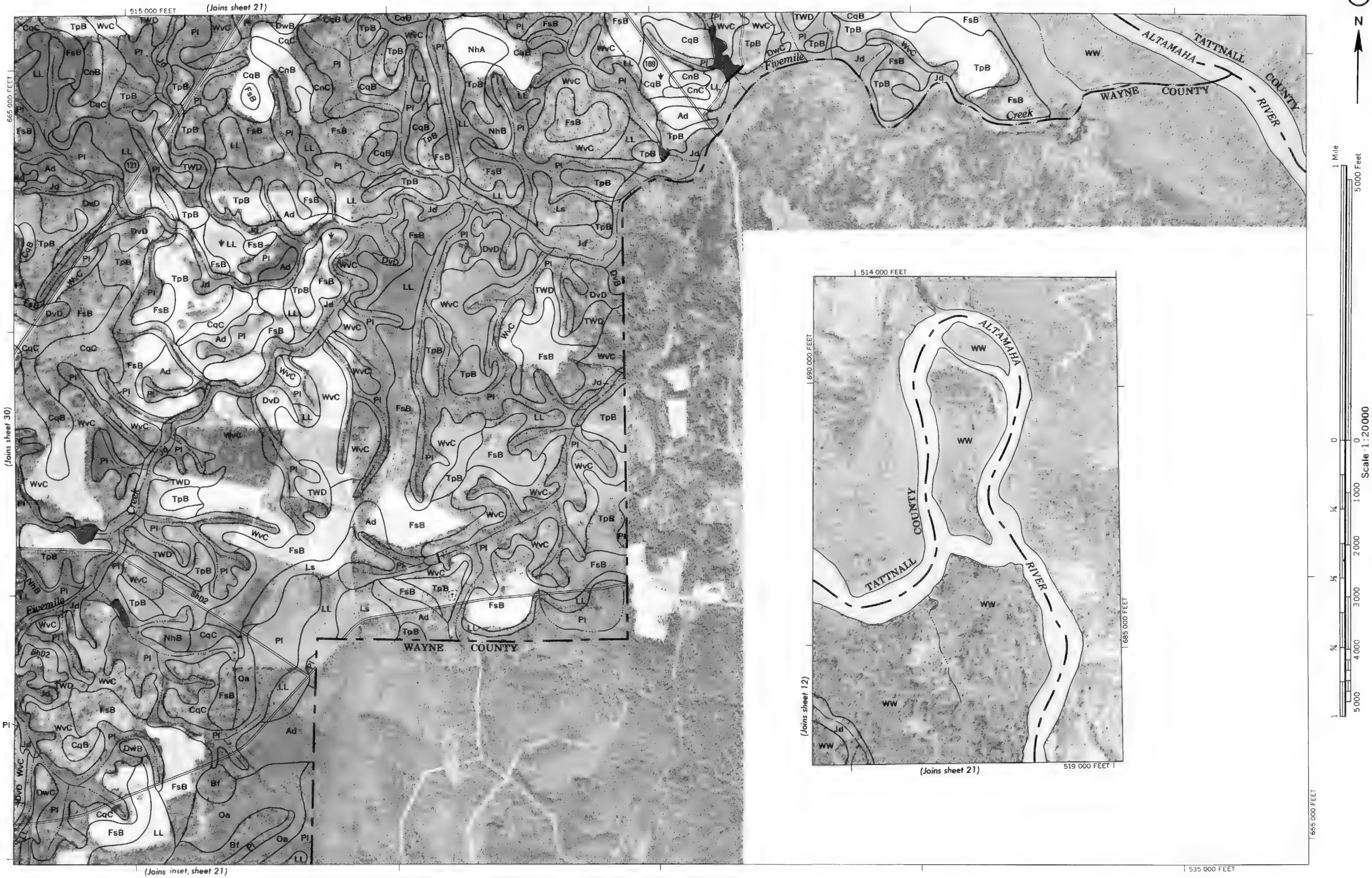

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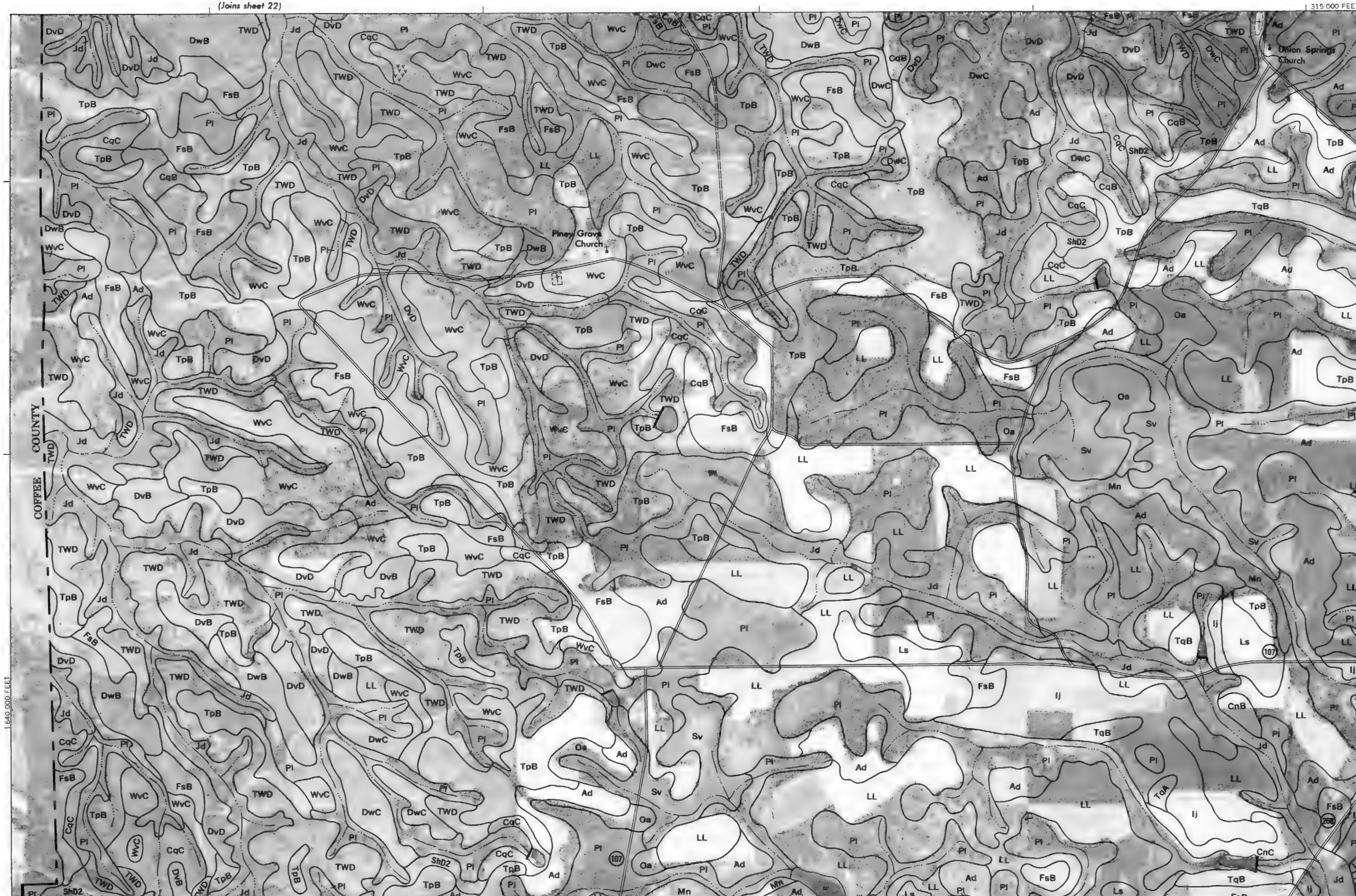
N

(Joins sheet 22)



(Joins sheet 41)

Scale 1:20000

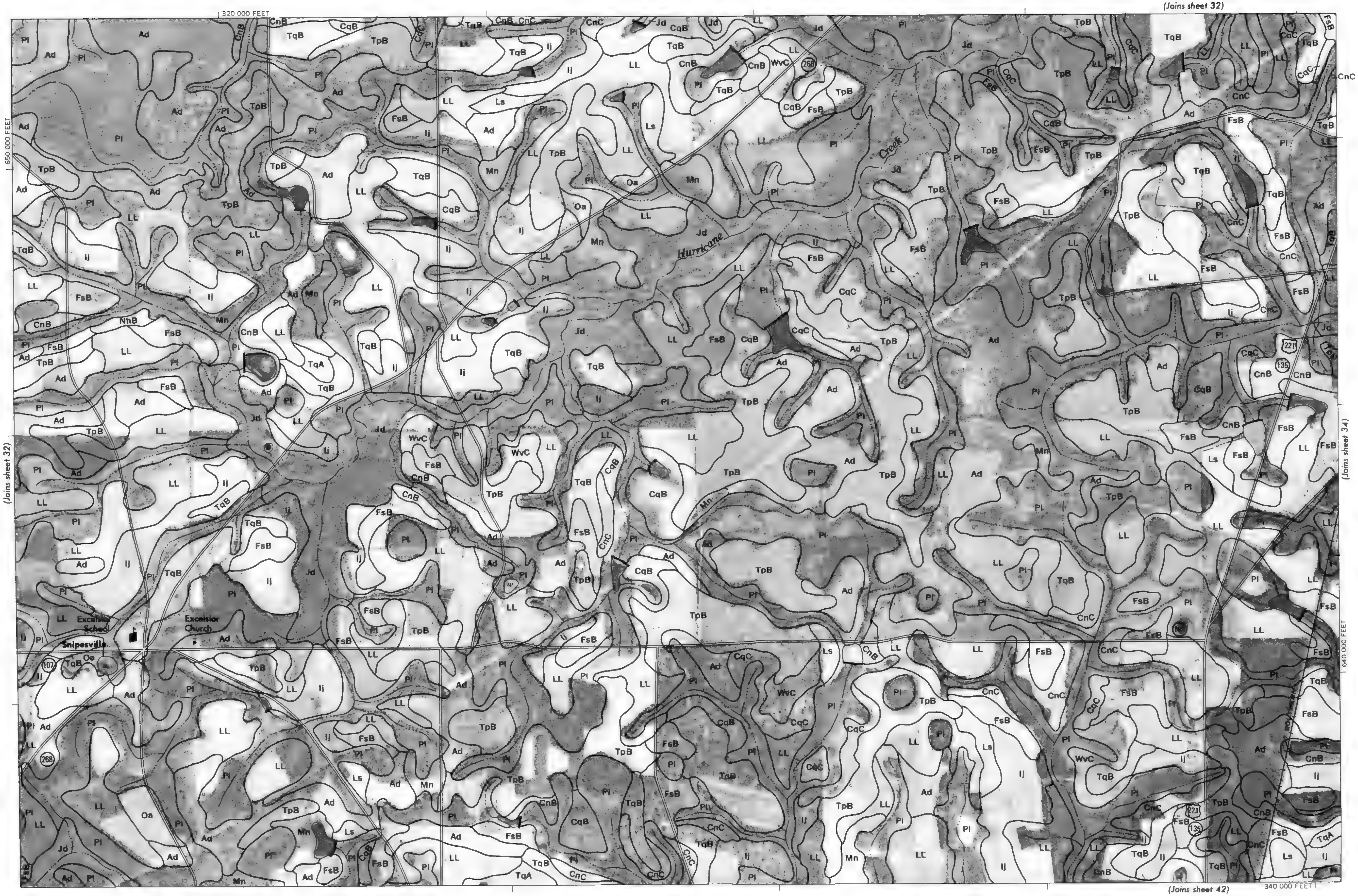
1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations



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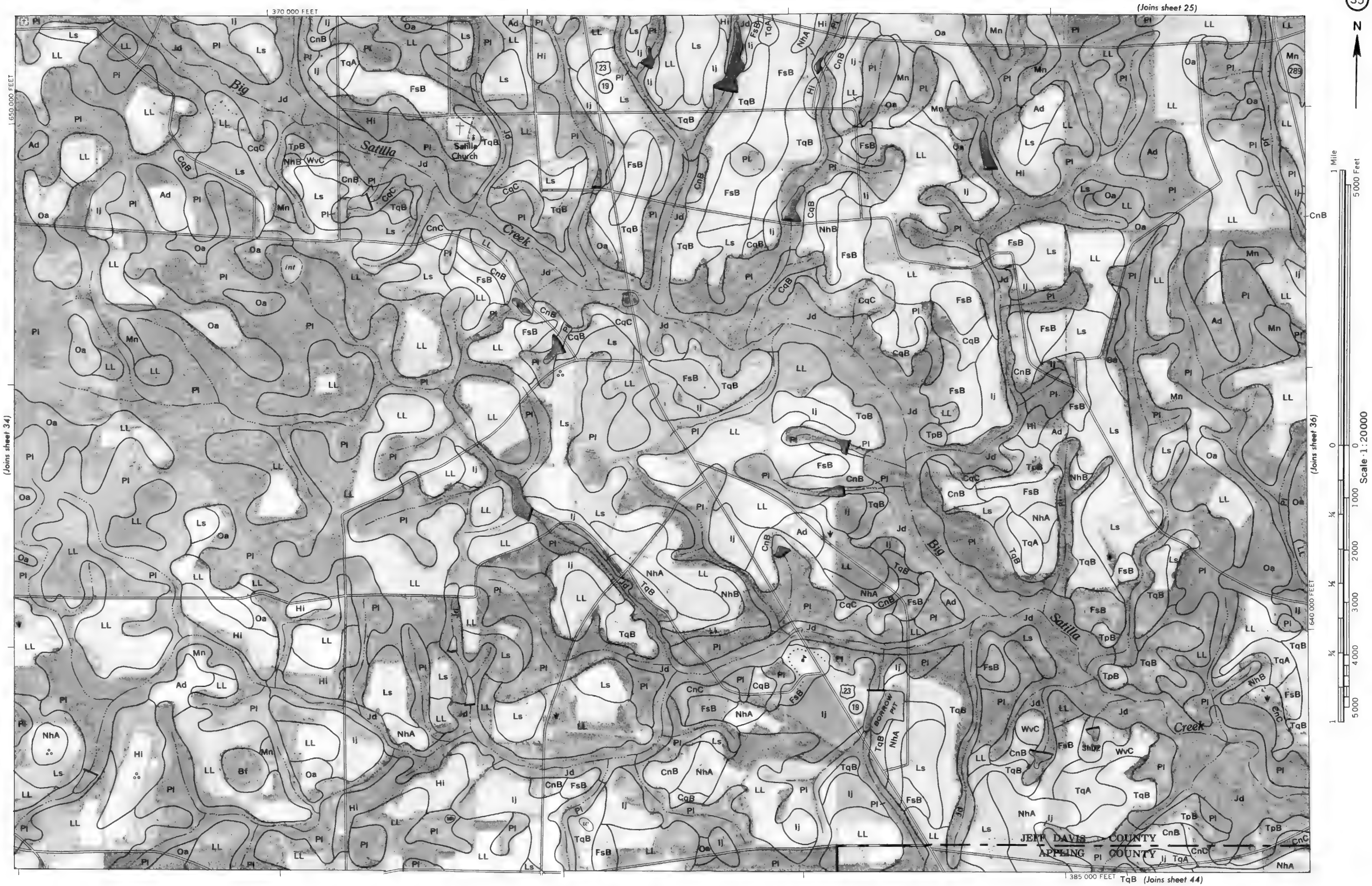

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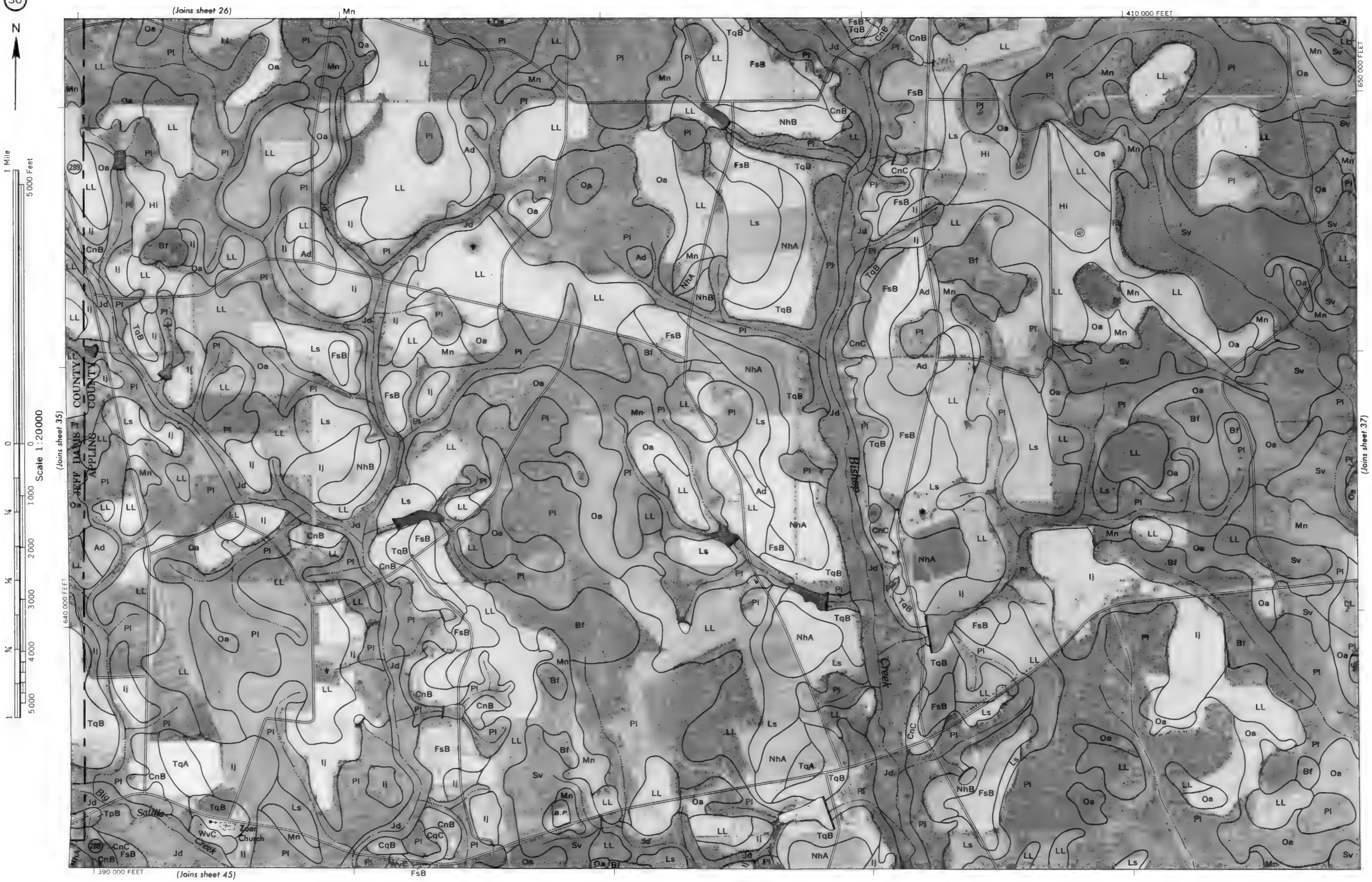

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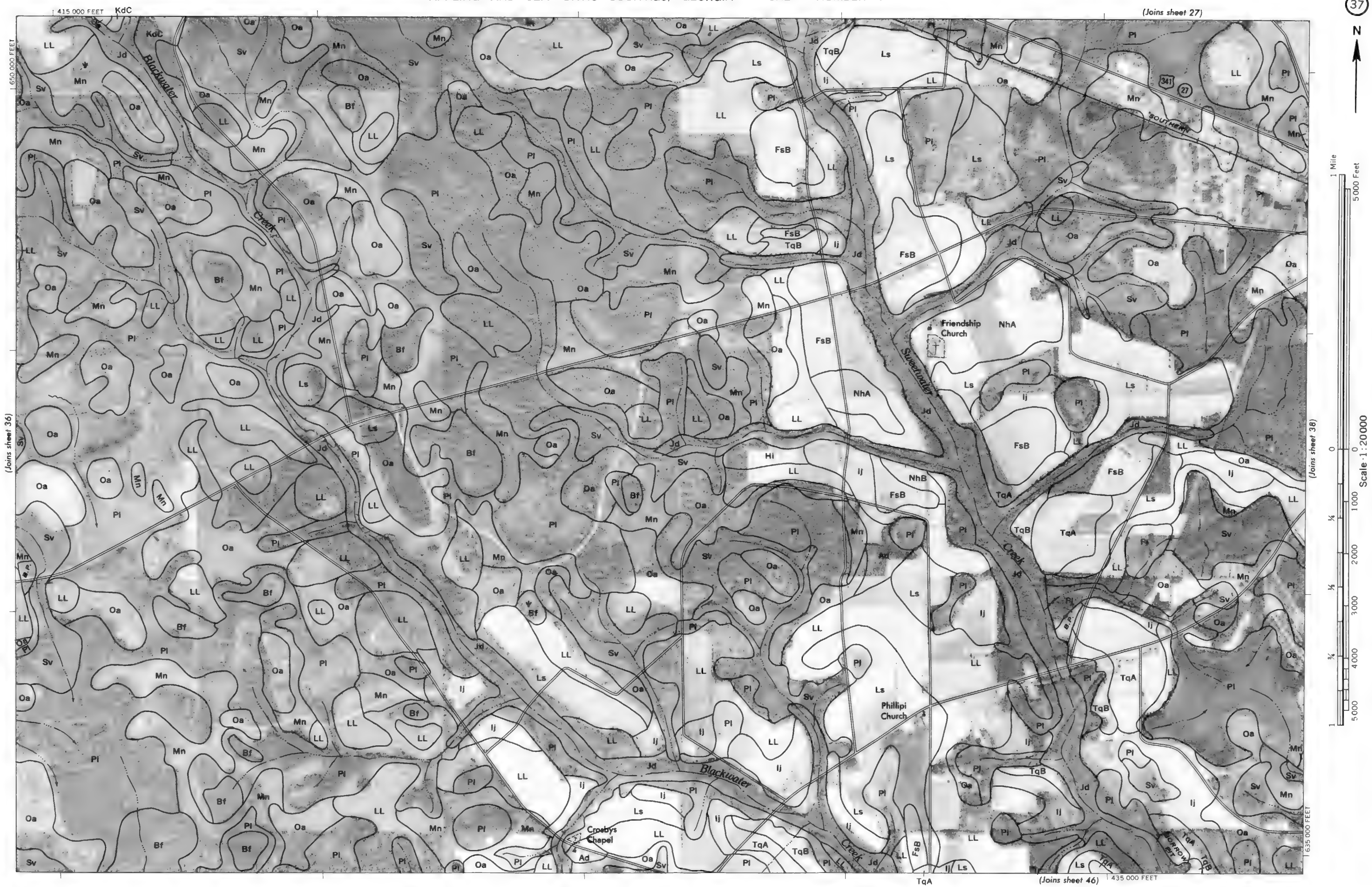

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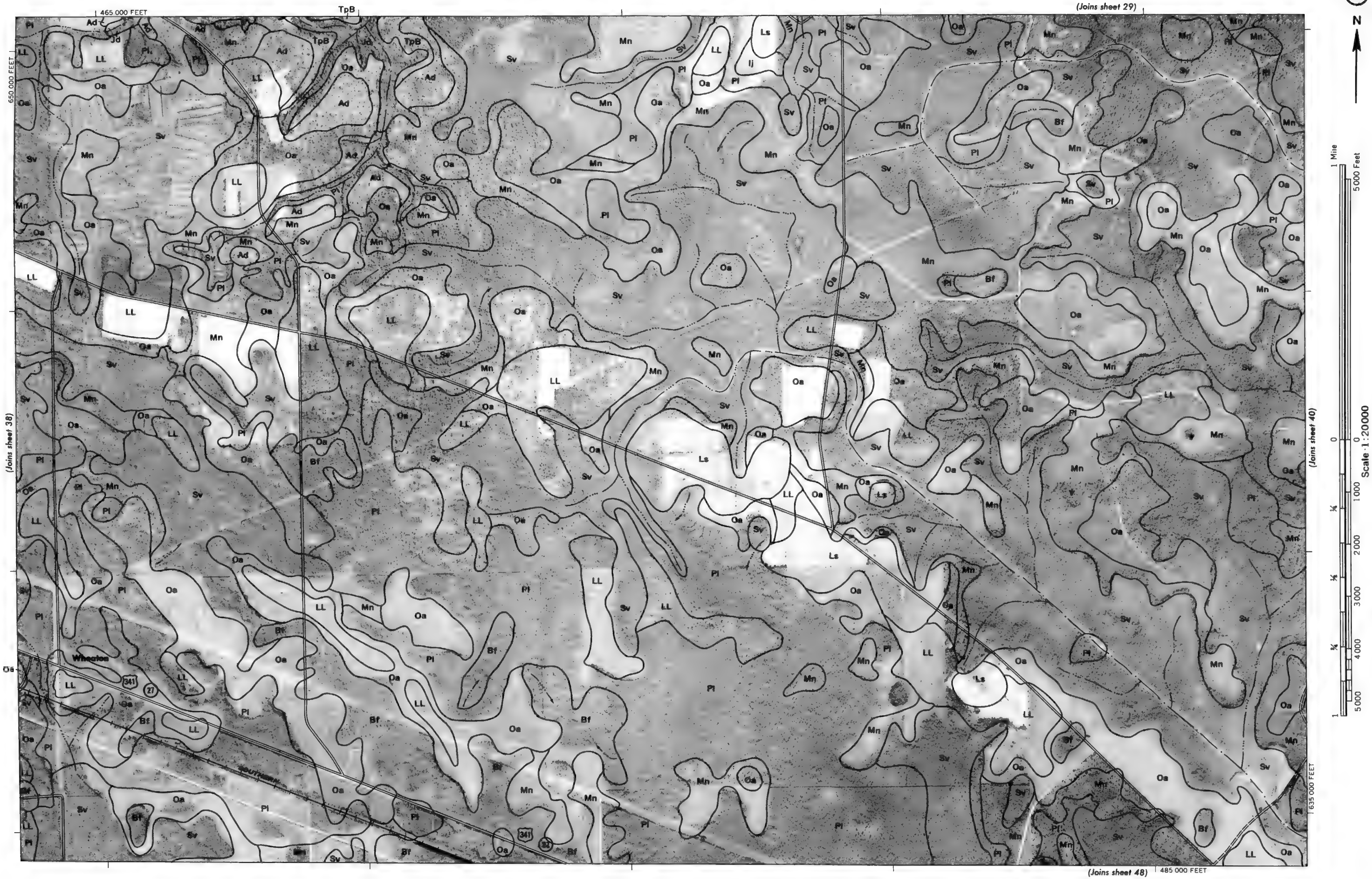

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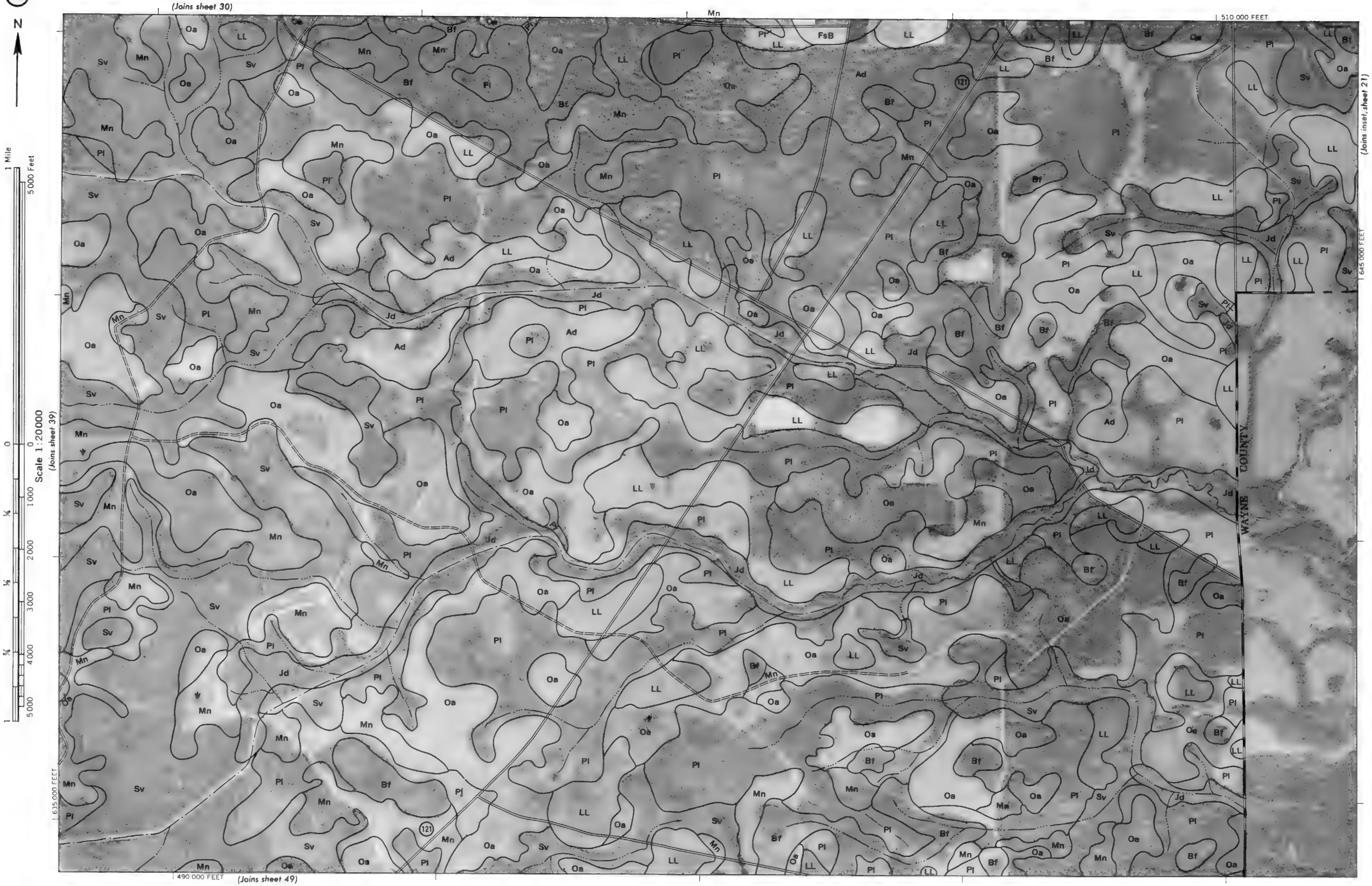

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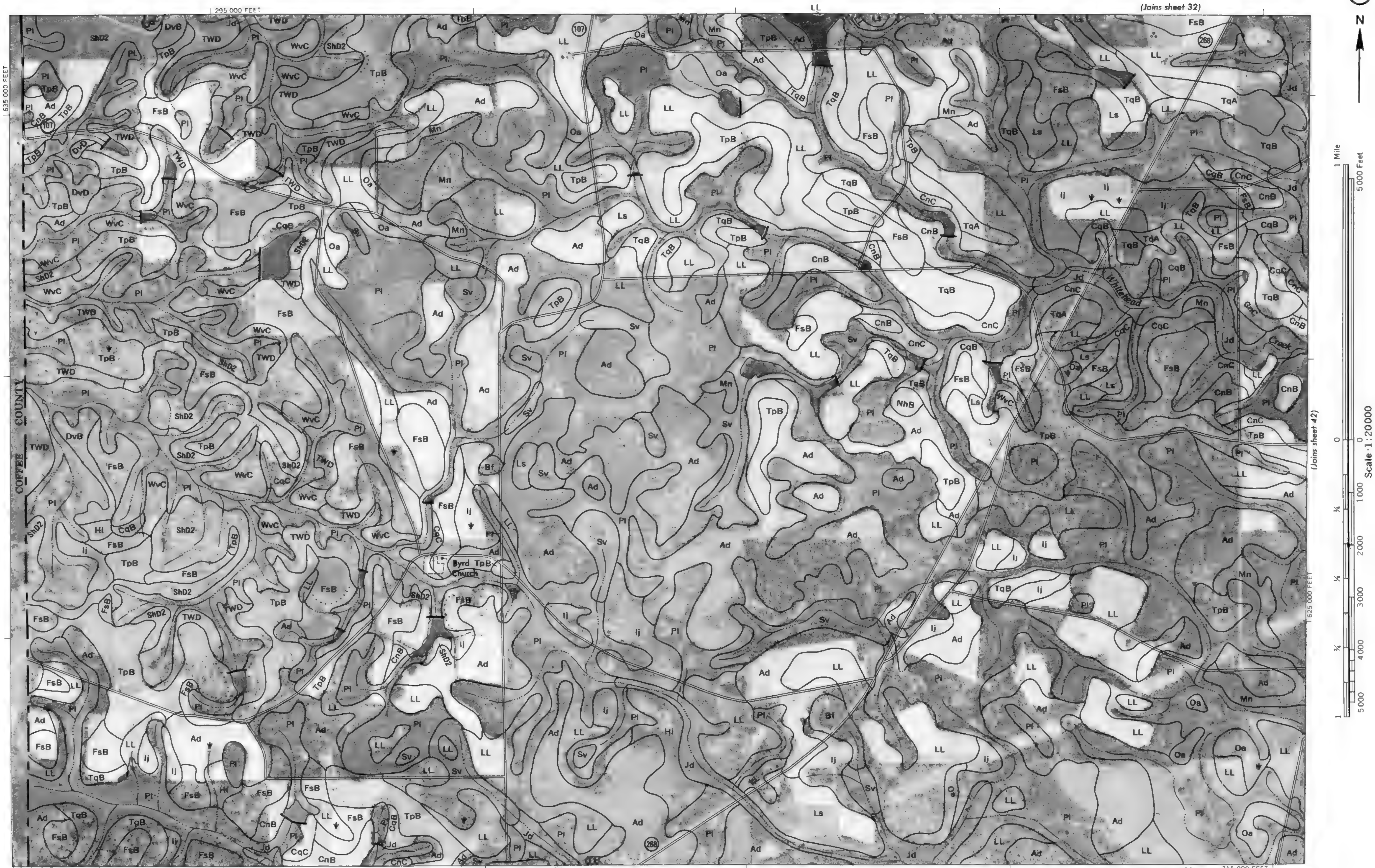

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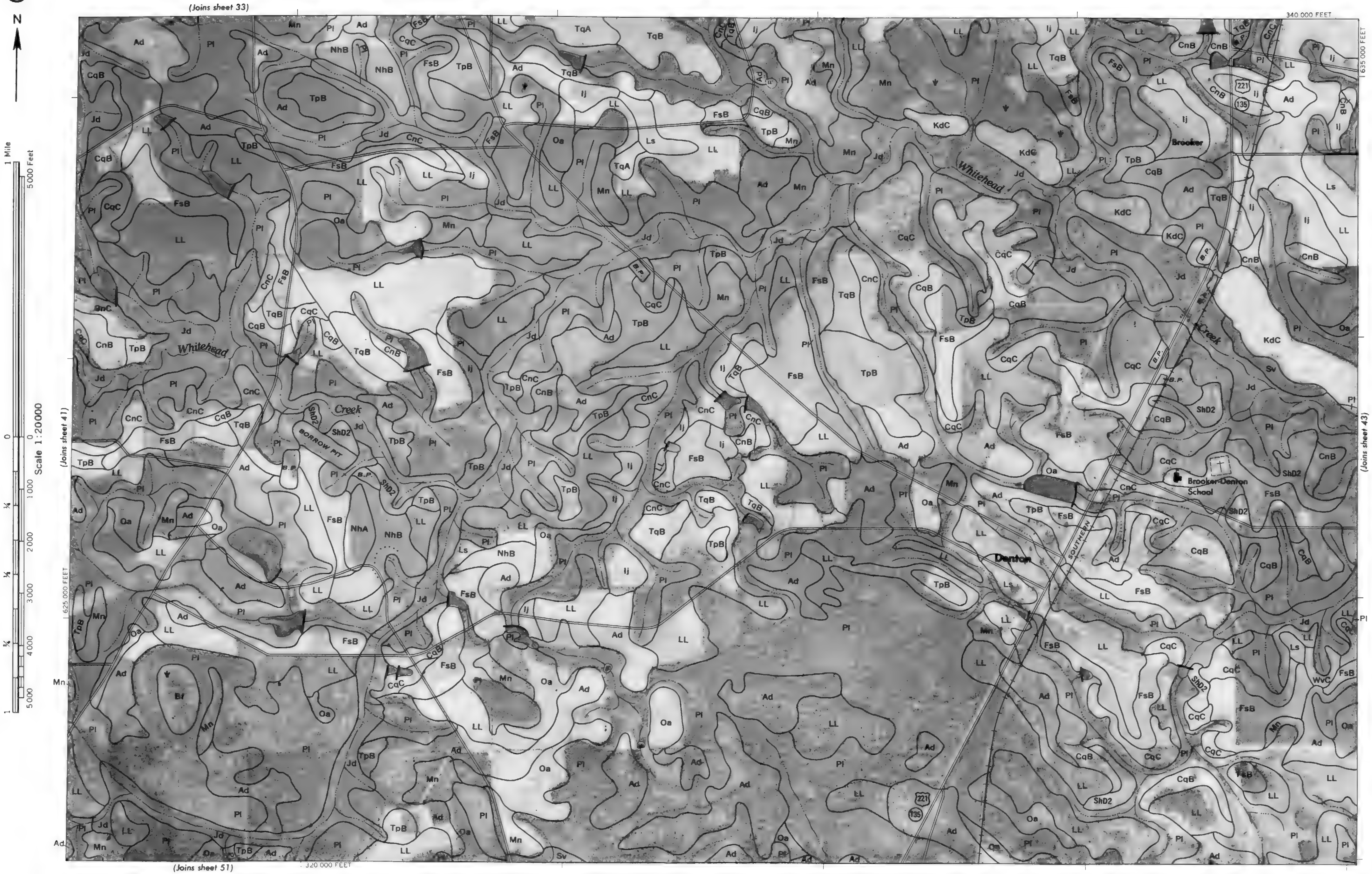

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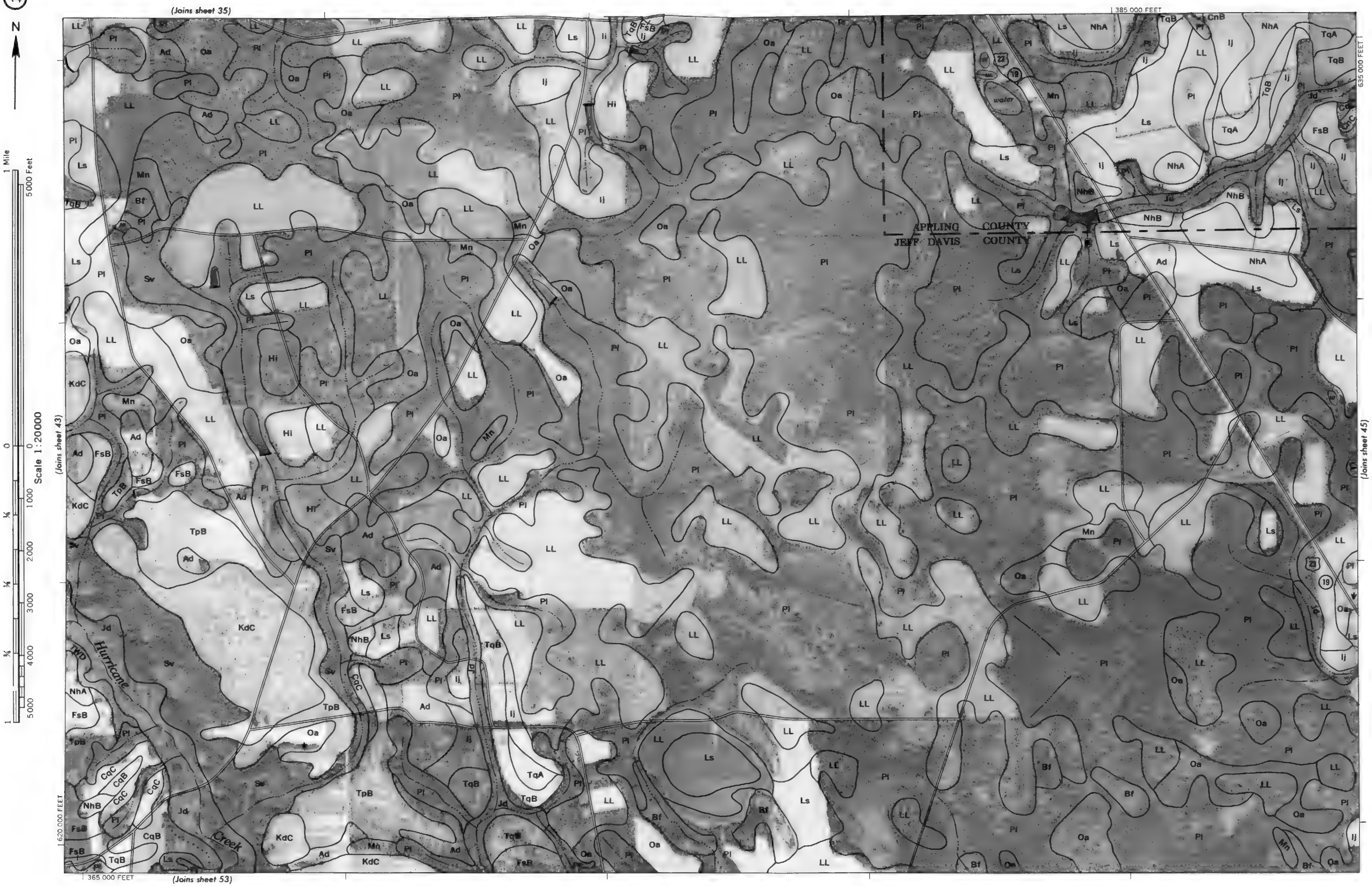

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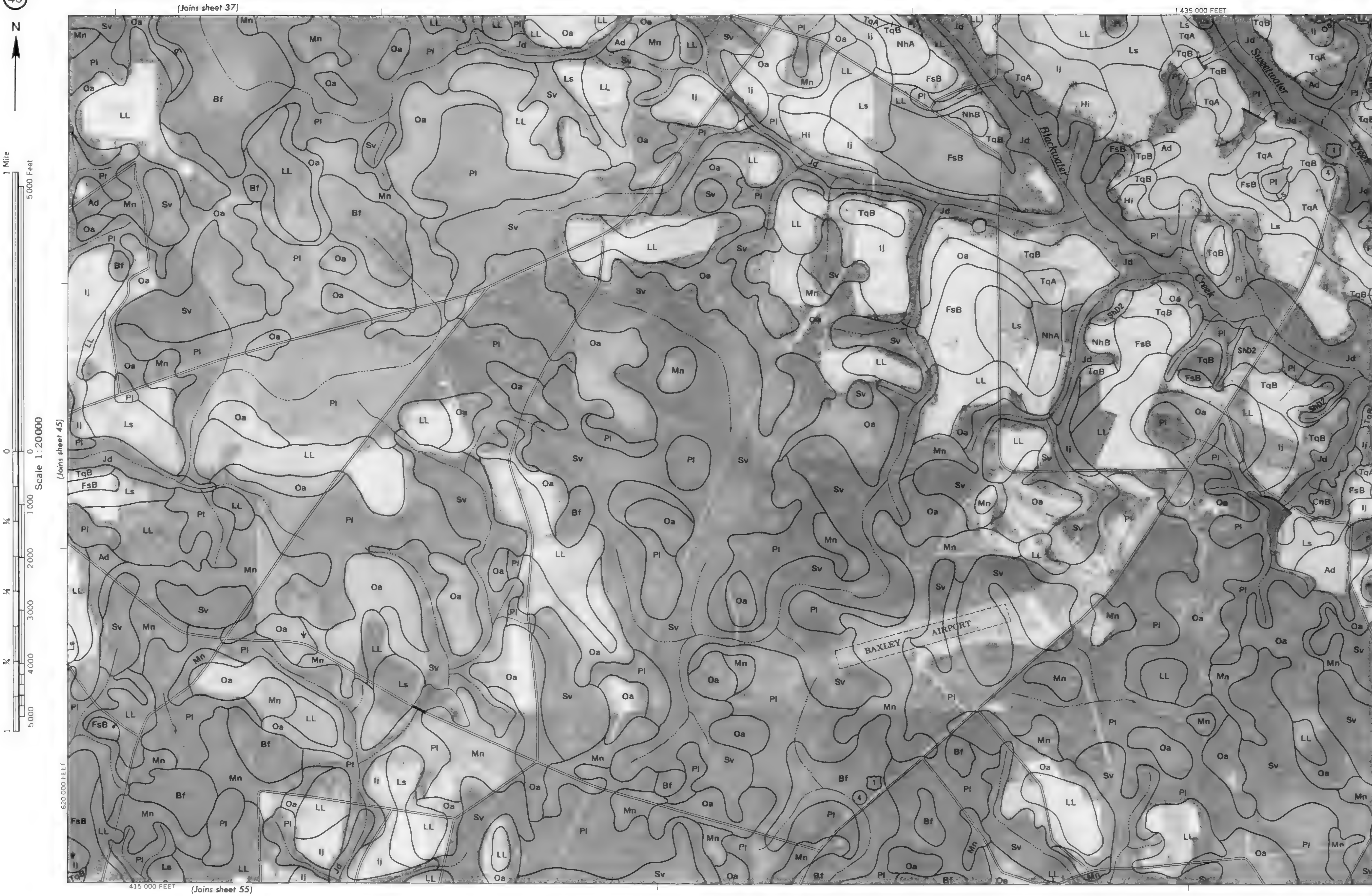
APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 46



Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.
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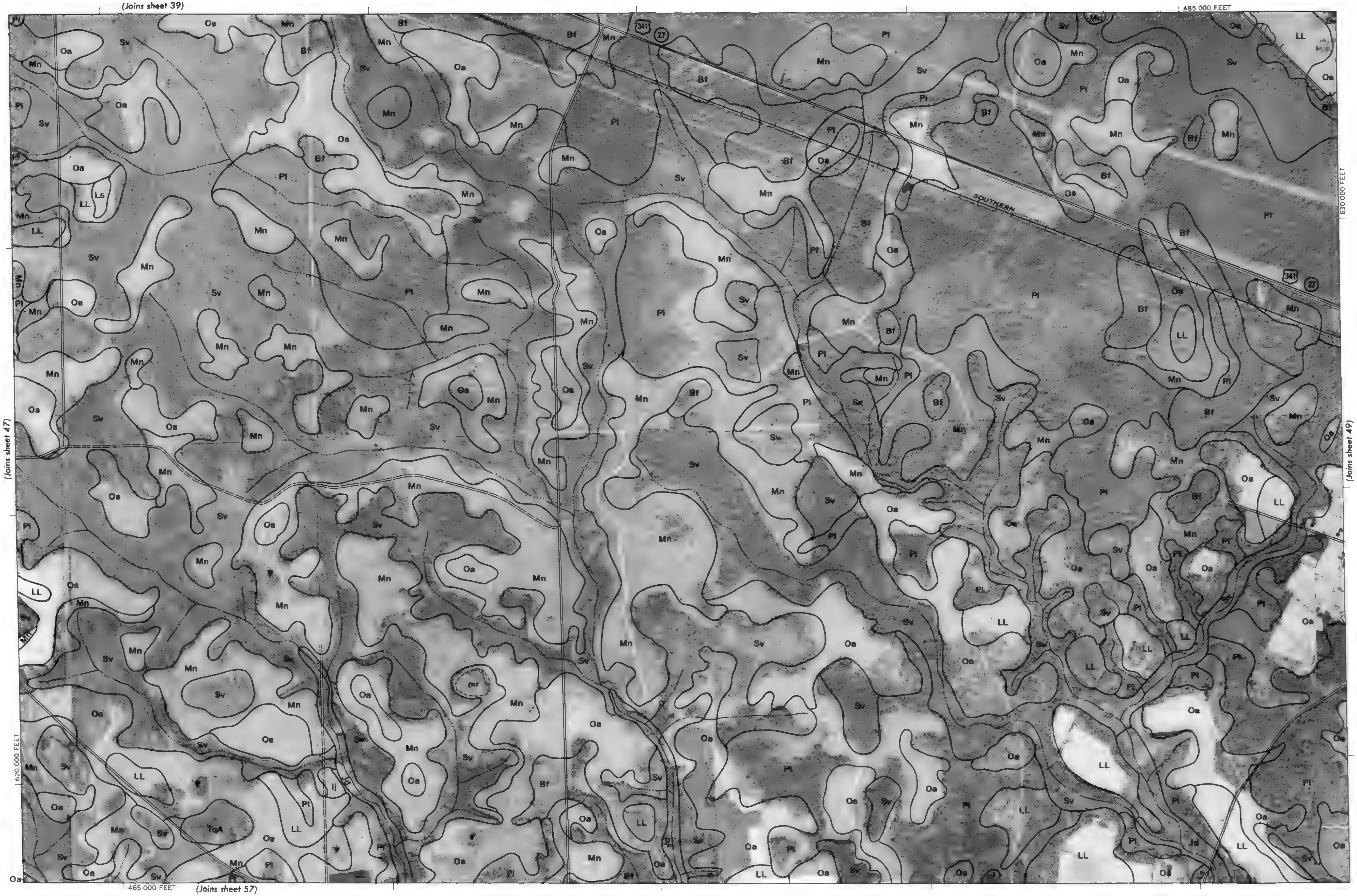

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.
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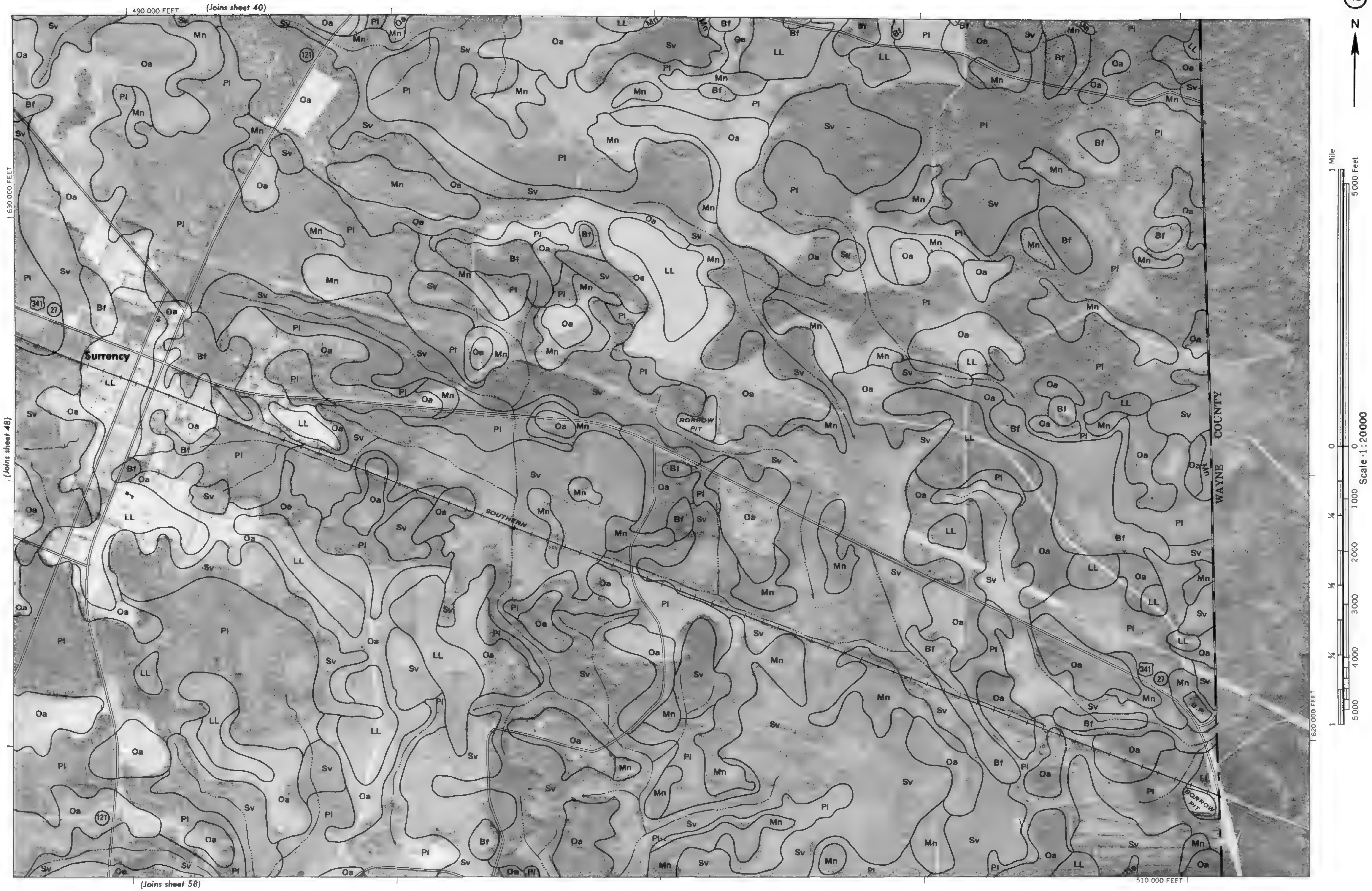

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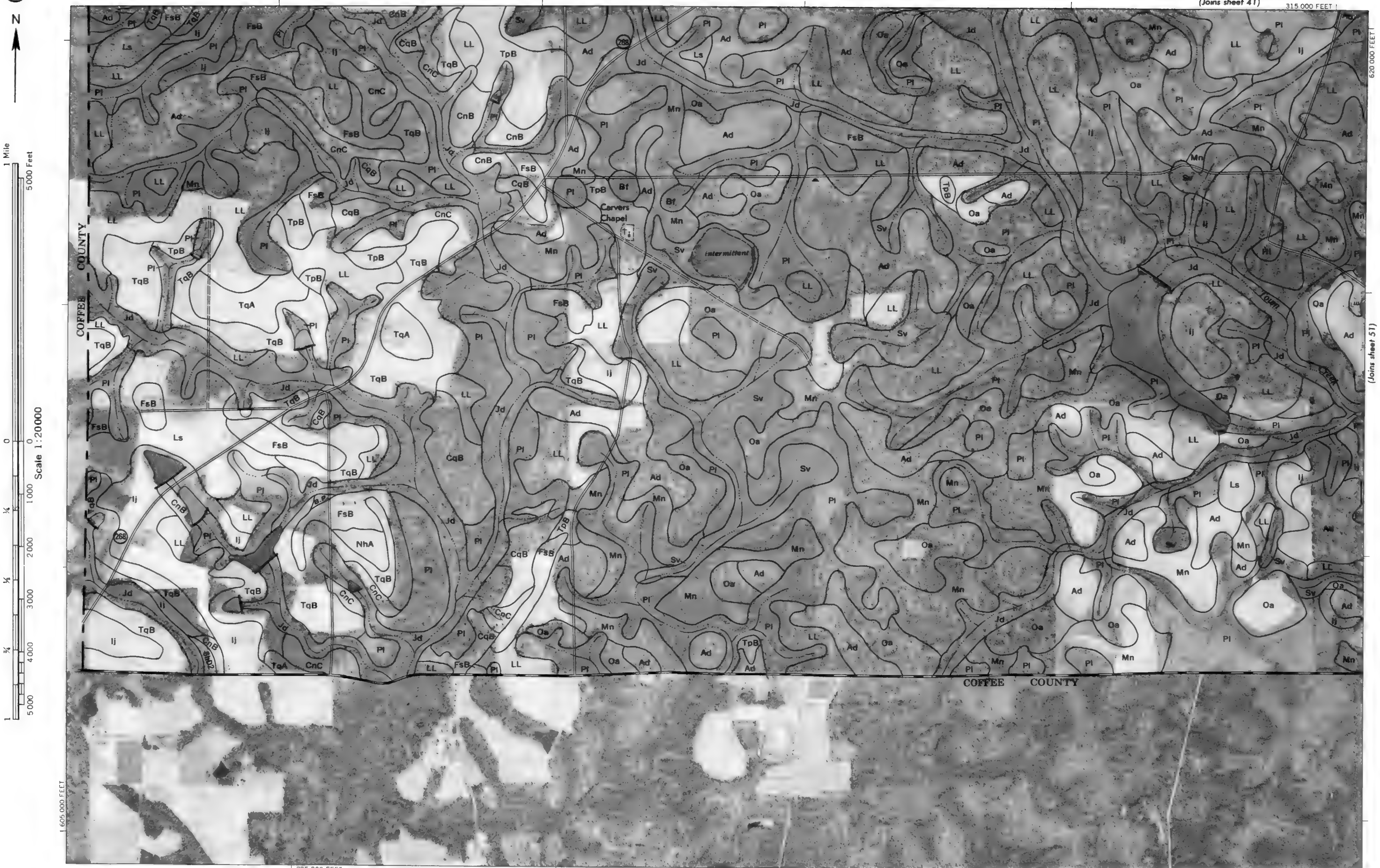
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 50



Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.
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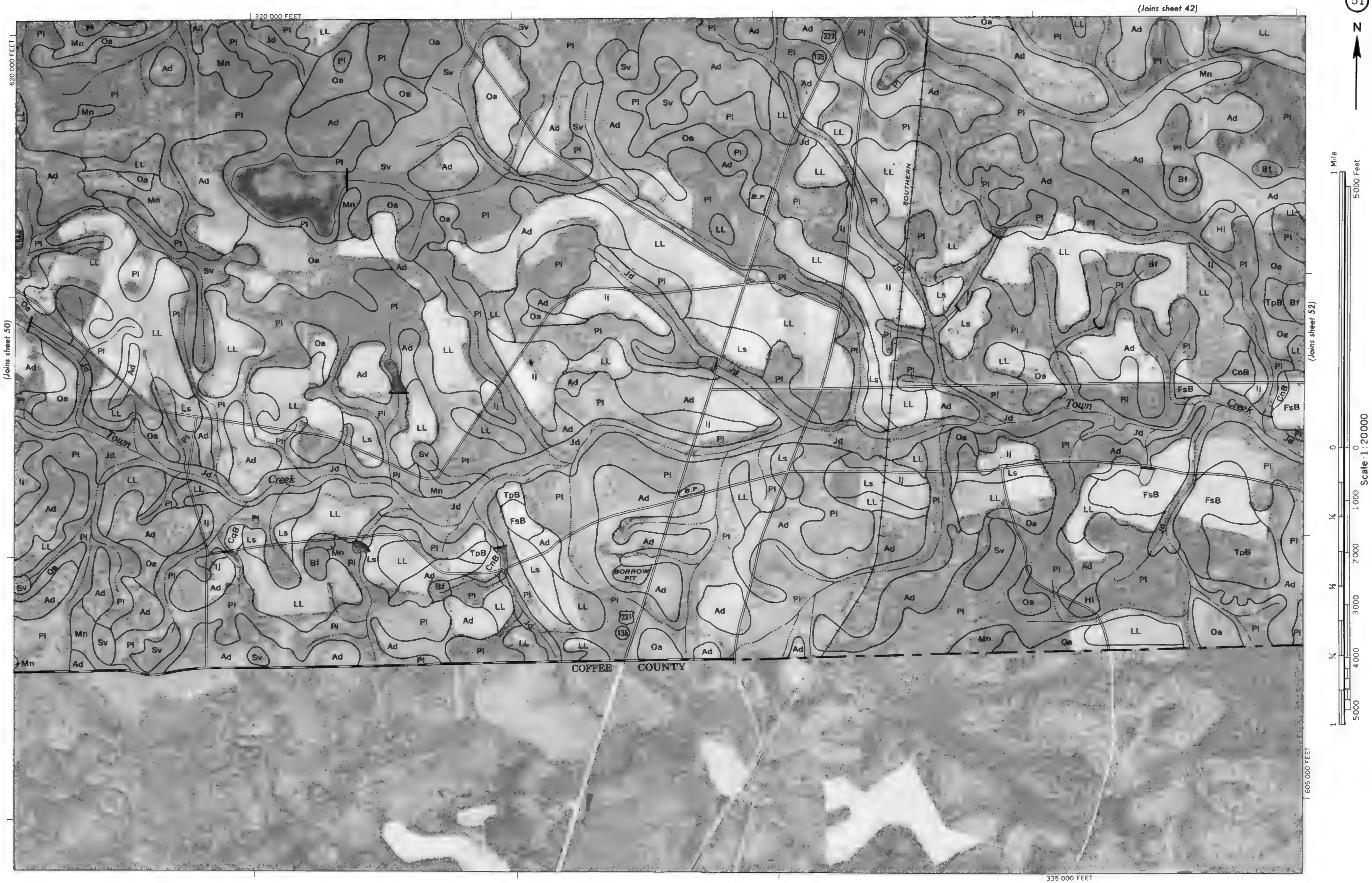

Scale 1:20000

1 Mile

5000 Feet

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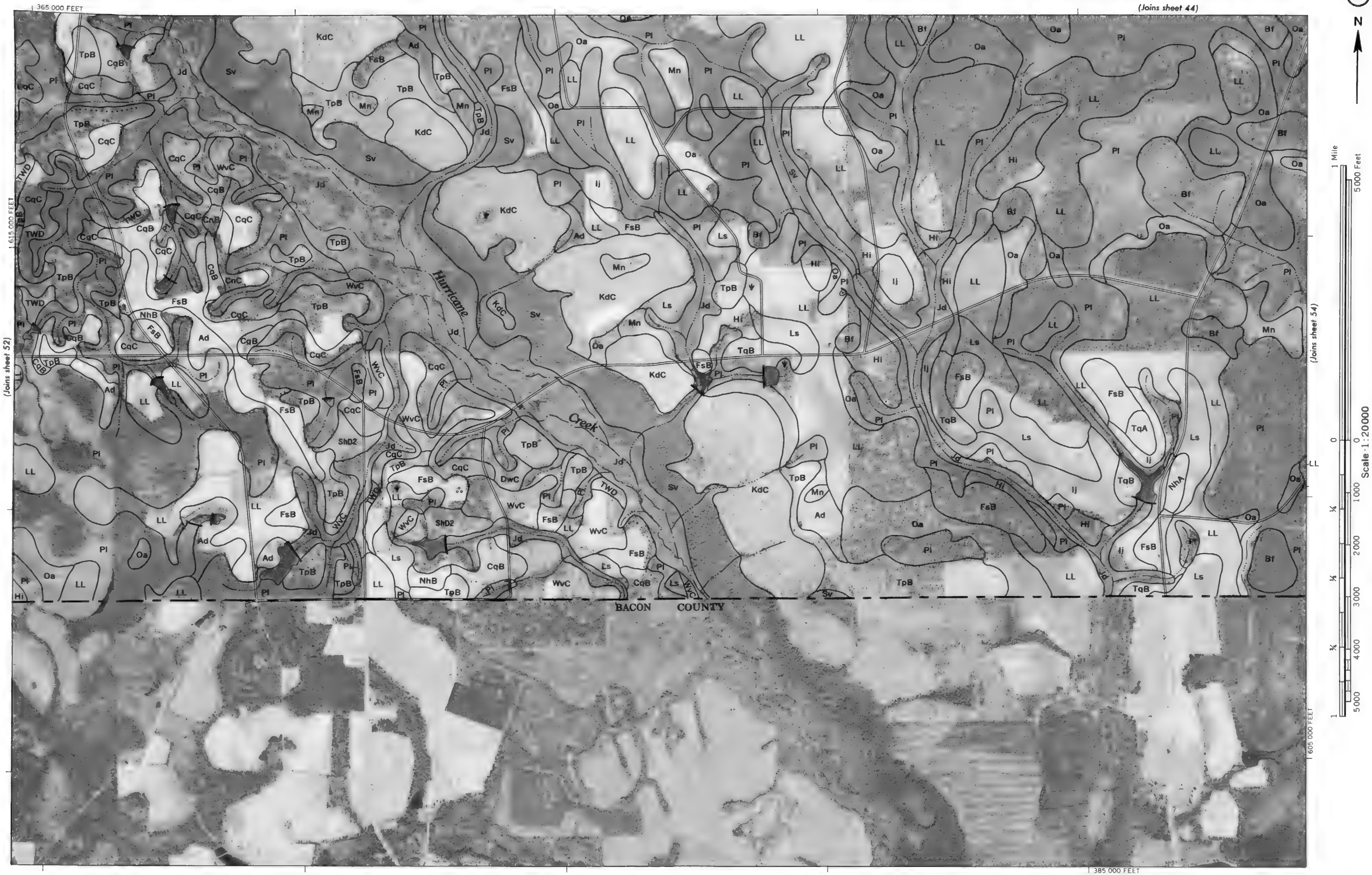
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 52

N

1 Mile
5000 Feet
Scale 1:20000
0 0 1000 ¼ 2000 ½ 3000 ¾ 4000 1 5000

Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.
This map is one of a set compiled in 1972 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the University of Georgia, College of Agriculture, Agricultural Experiment Stations



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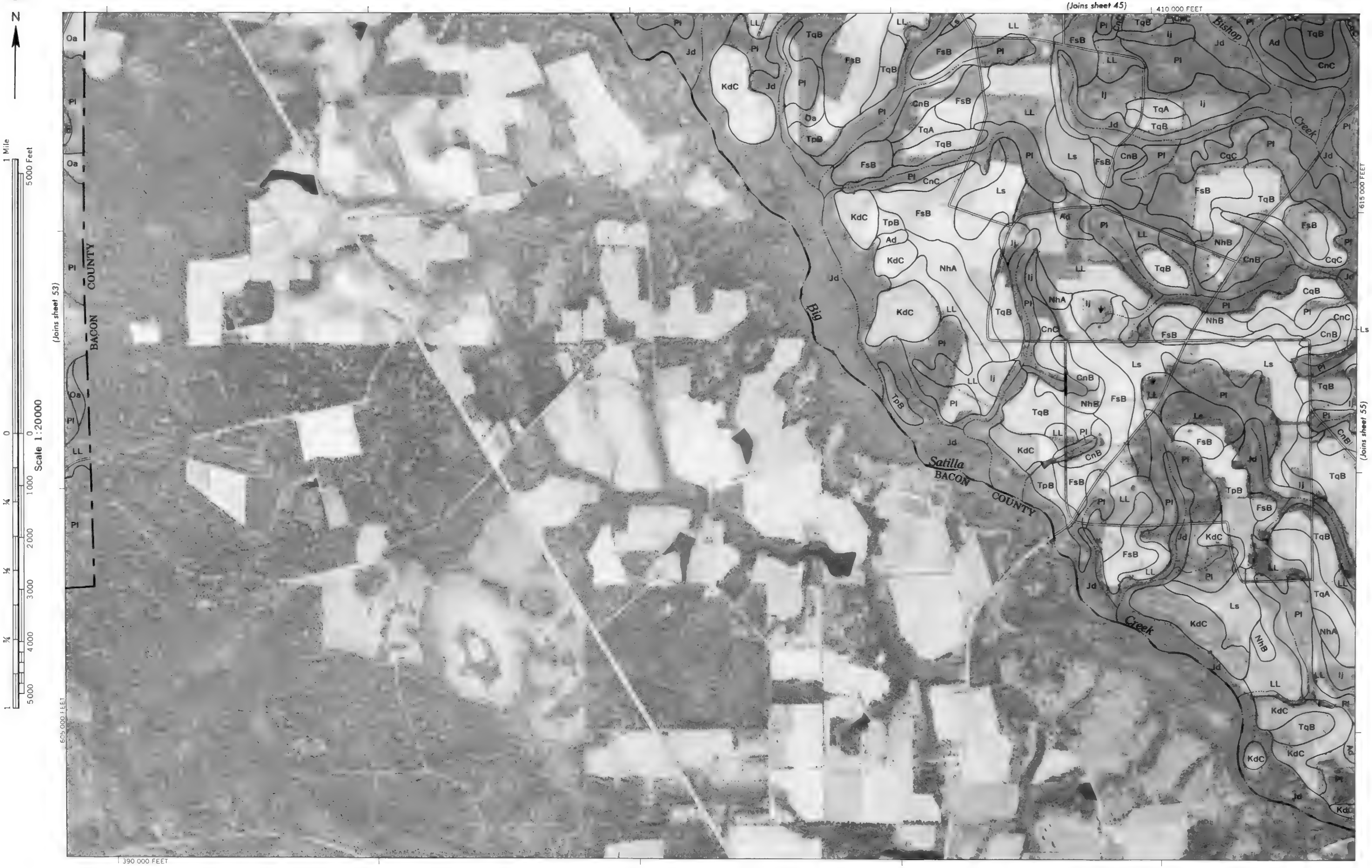
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 54



Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.
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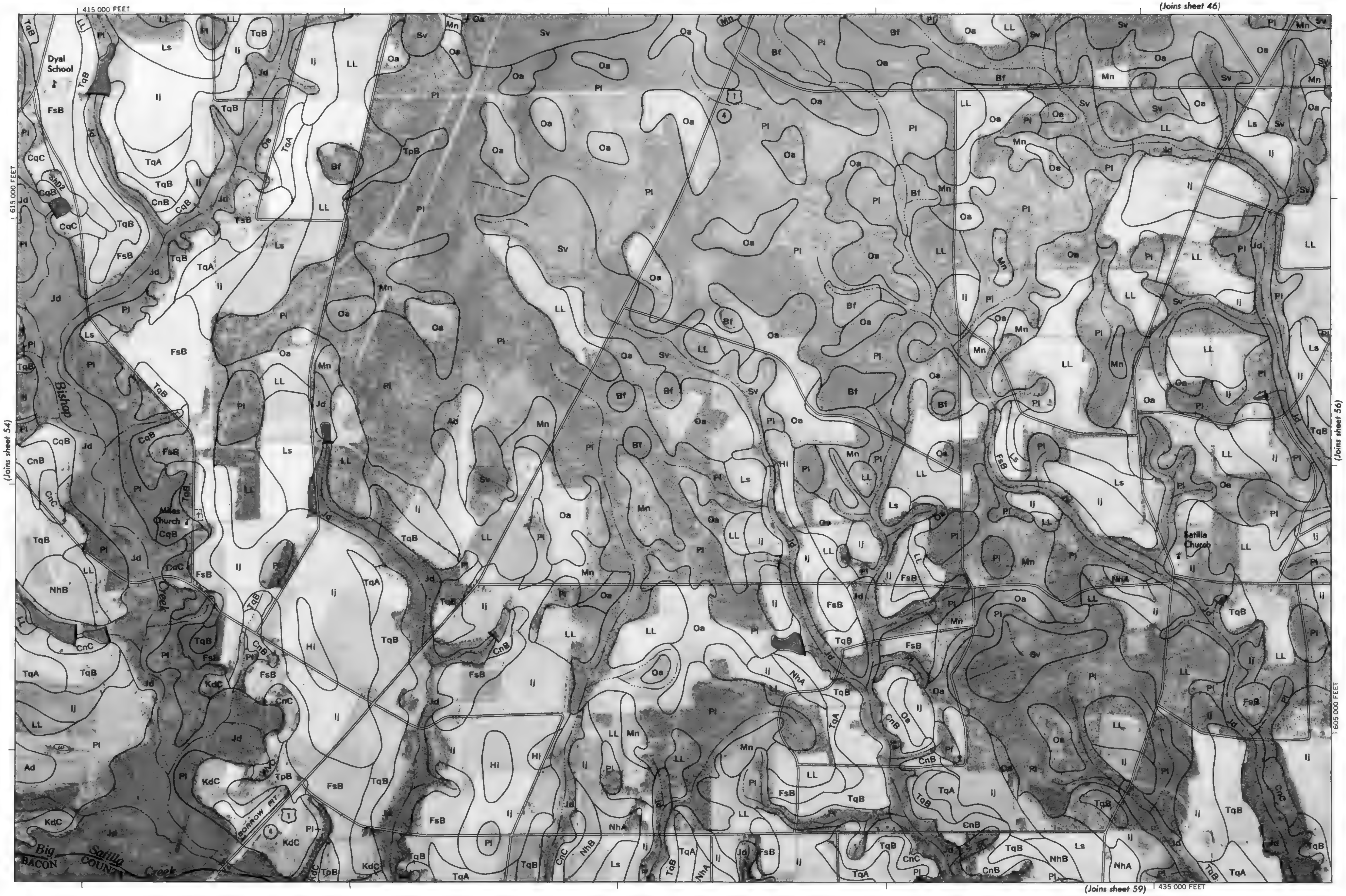

N

1 Mile

5000 Feet

0

1000

2000

3000

4000

5000

Scale 1:20000

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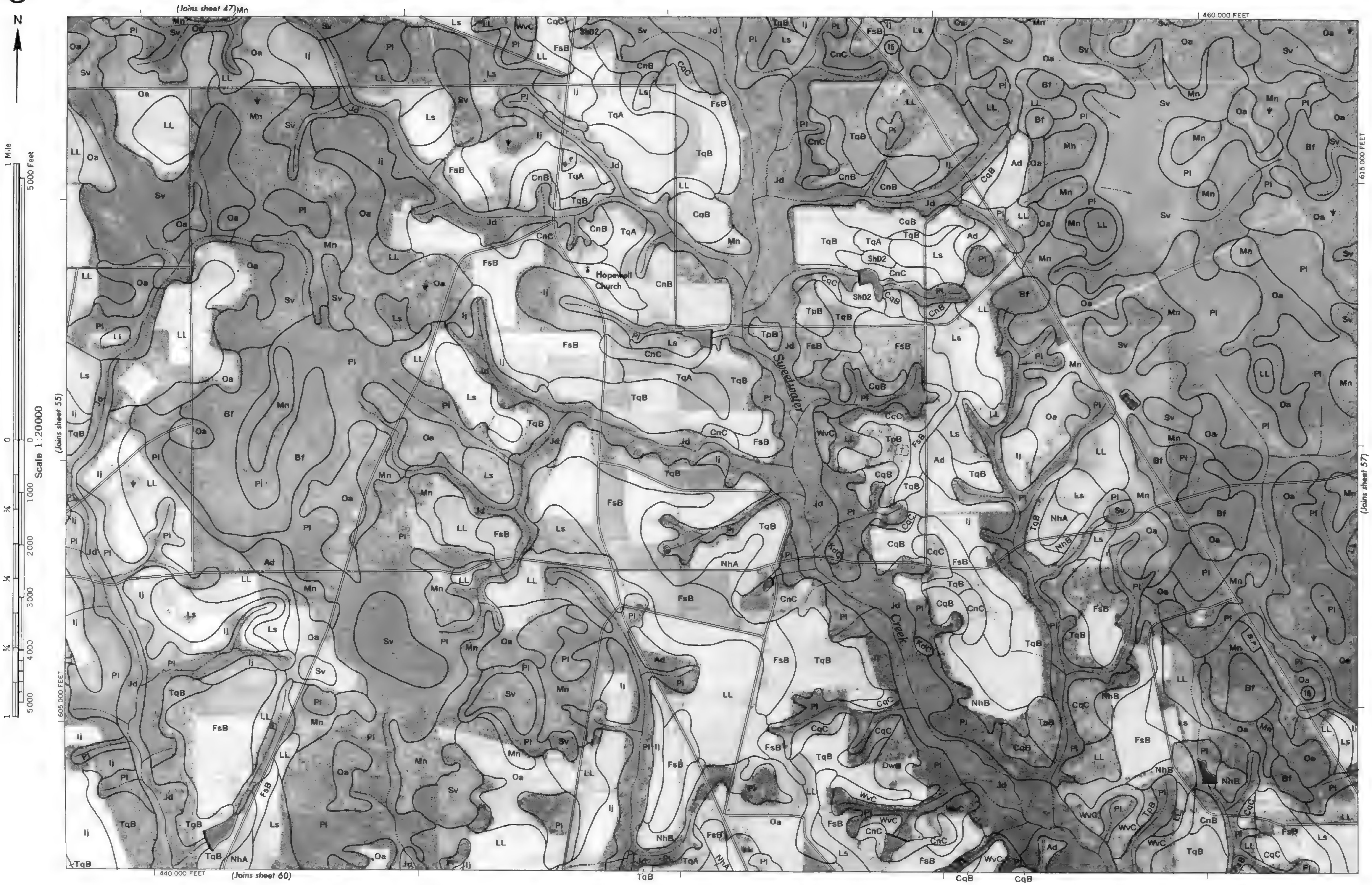
Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.

APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 56



Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.
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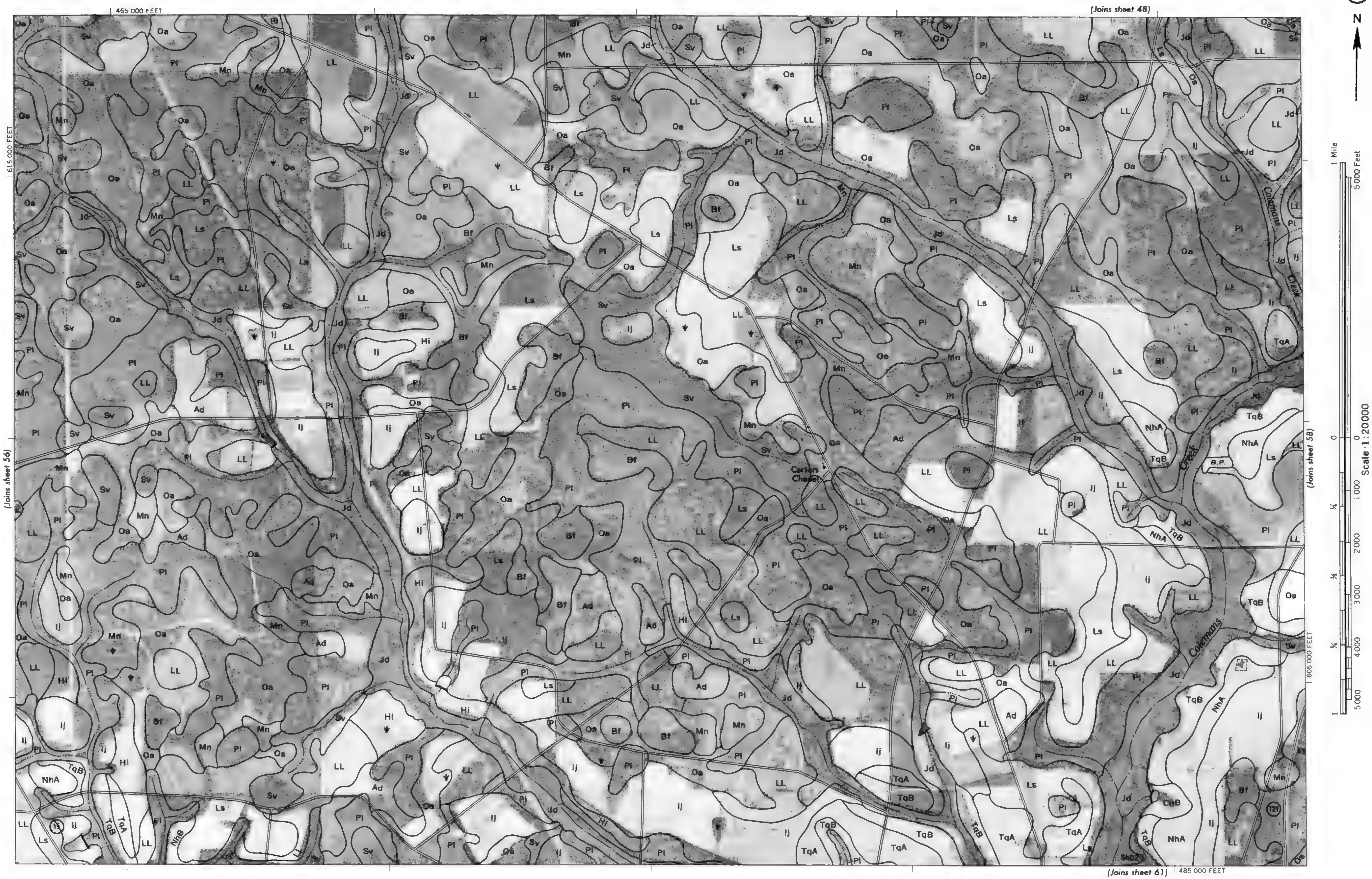

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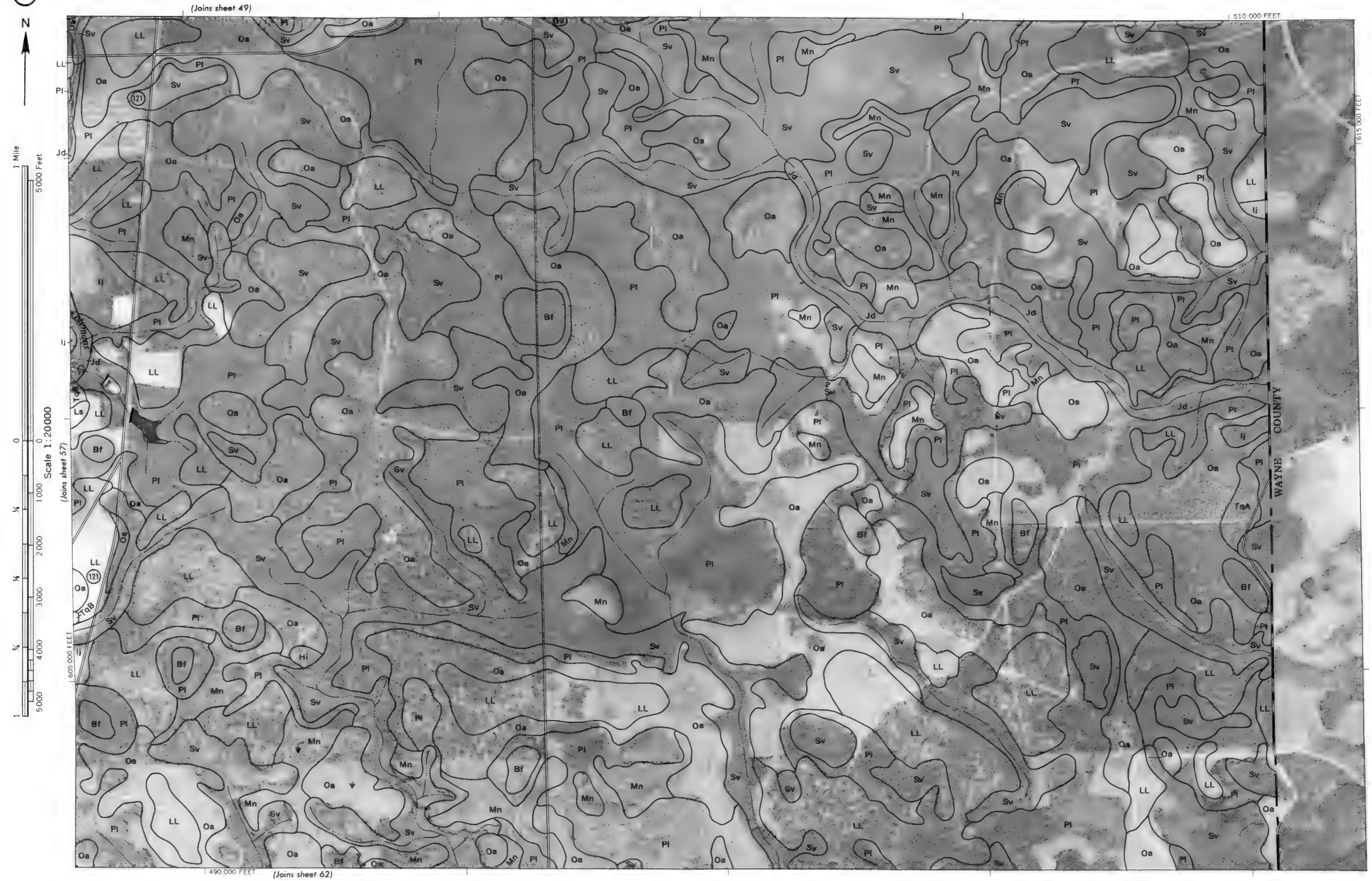

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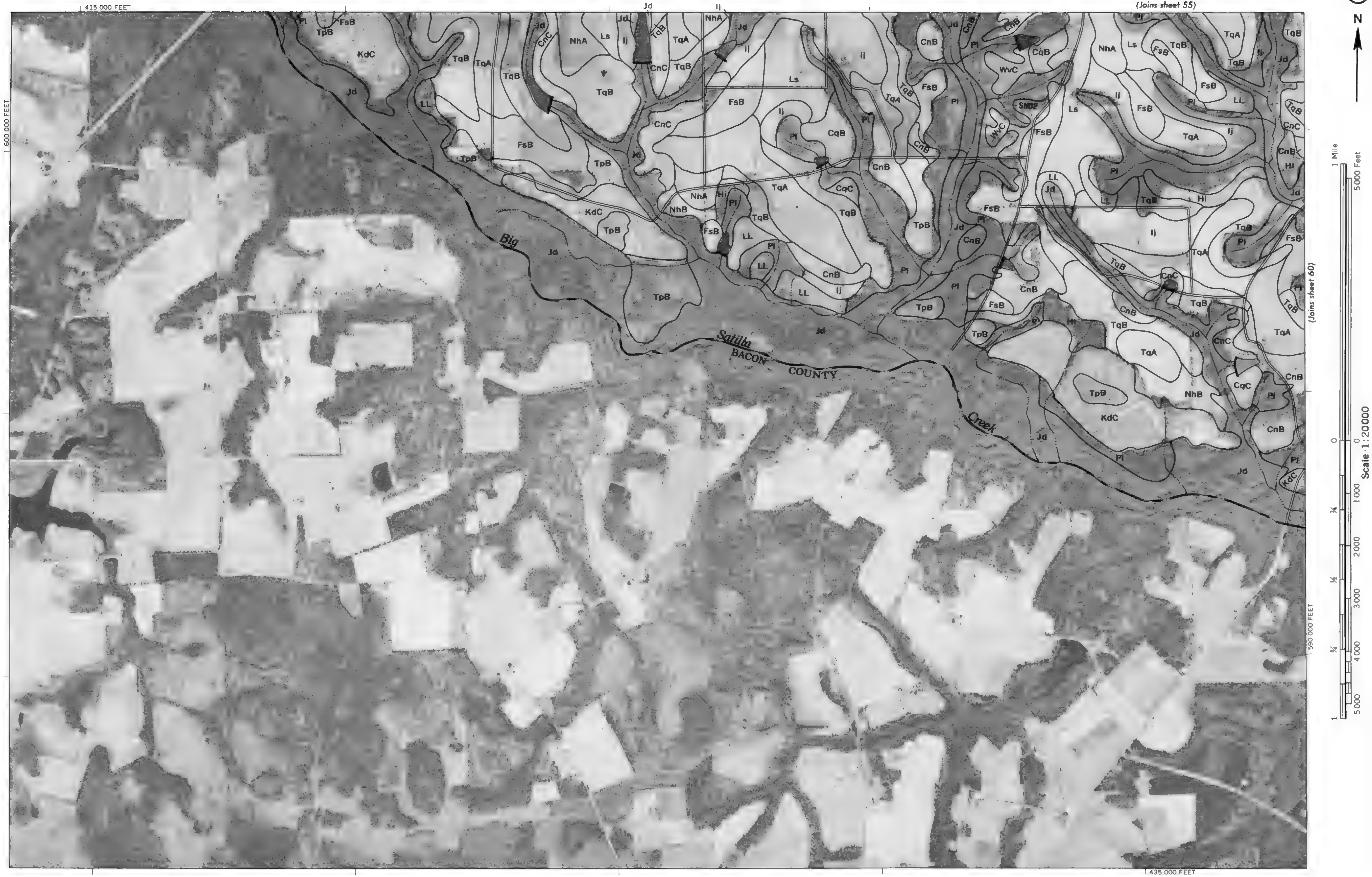

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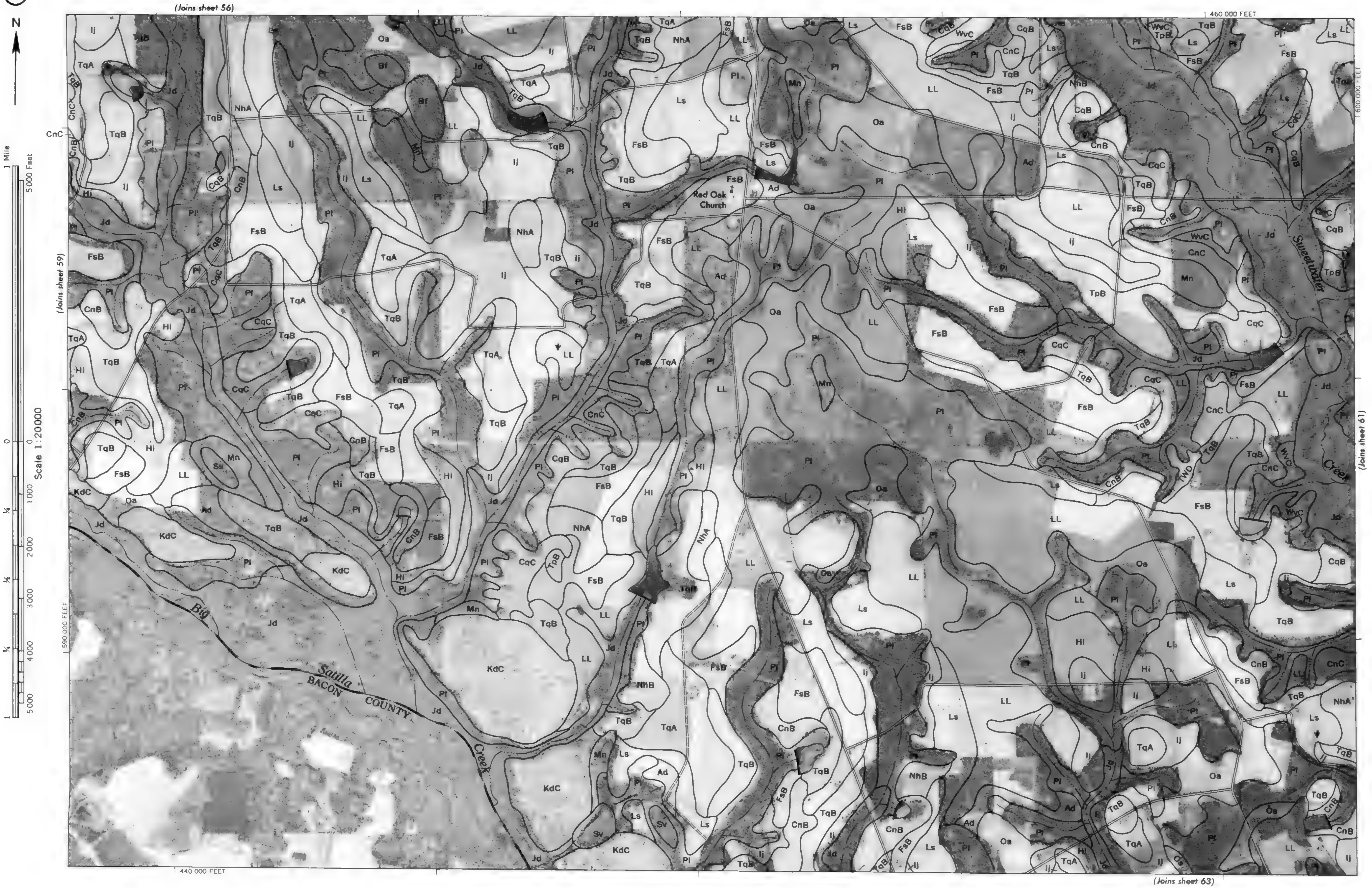

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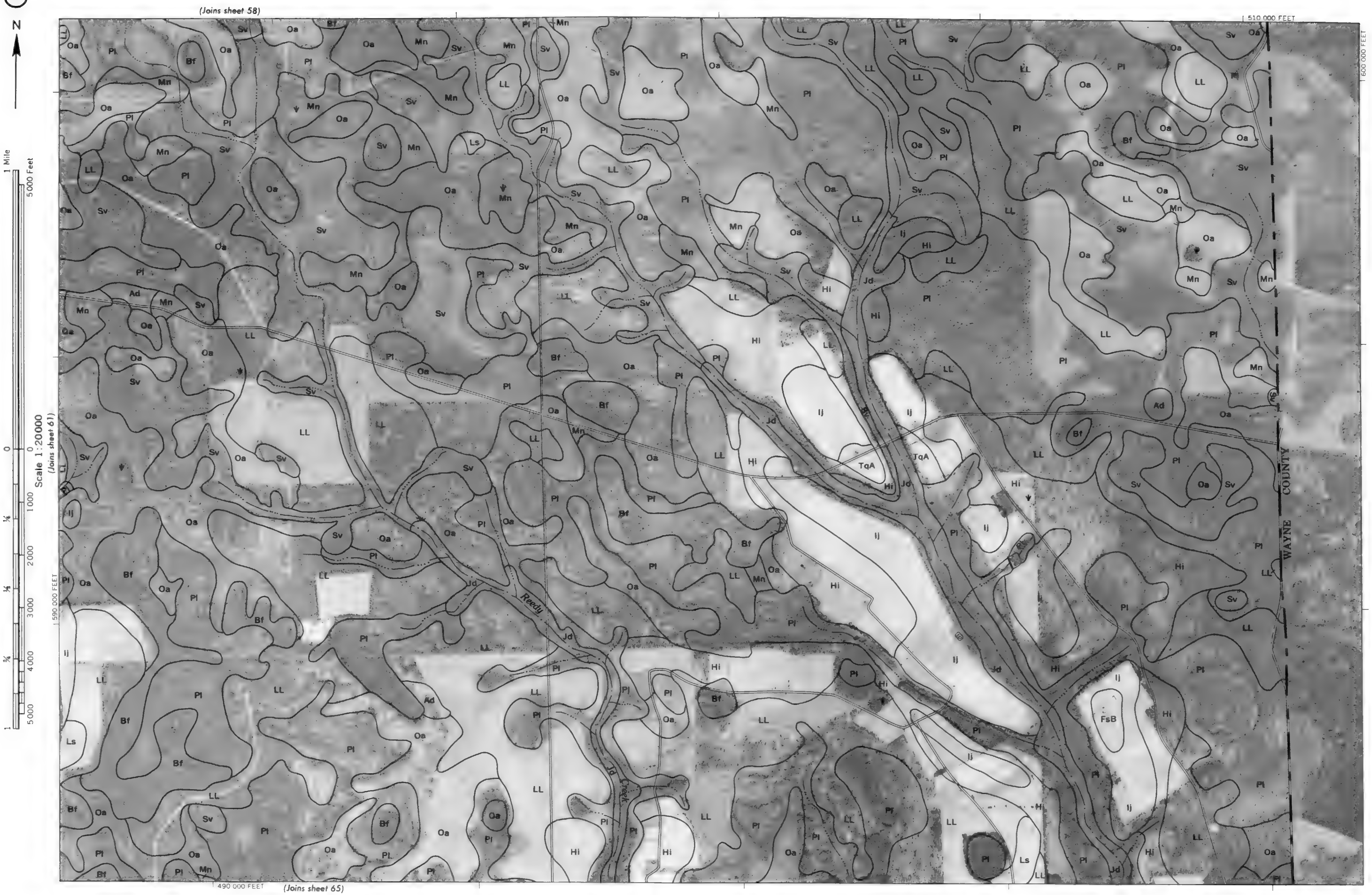
APPLING AND JEFF DAVIS COUNTIES, GEORGIA — SHEET NUMBER 62



Photobase from 1971 aerial photography. Positions of 5,000-foot grid ticks are approximate and based on the Georgia coordinate system, east zone.
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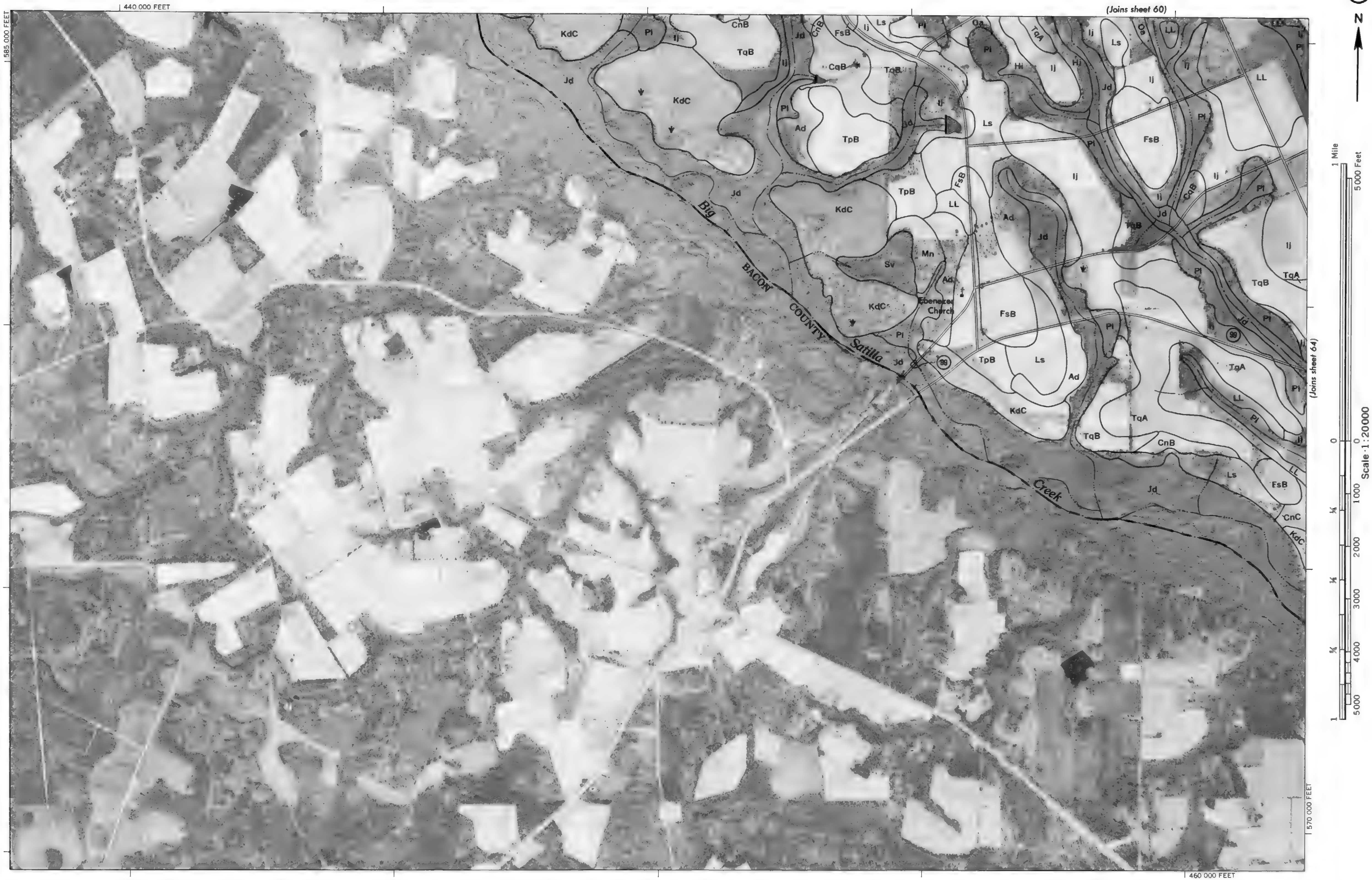

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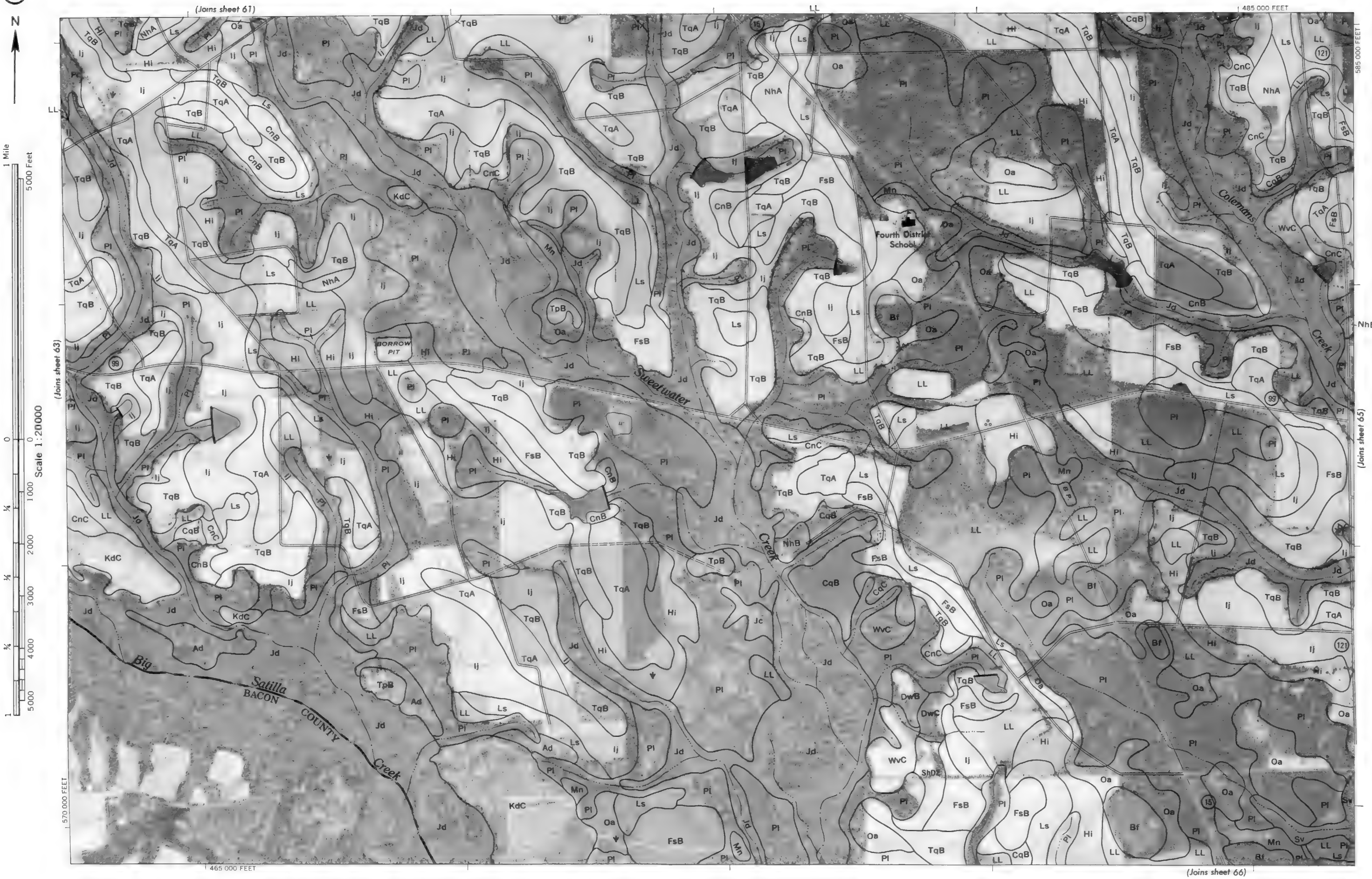

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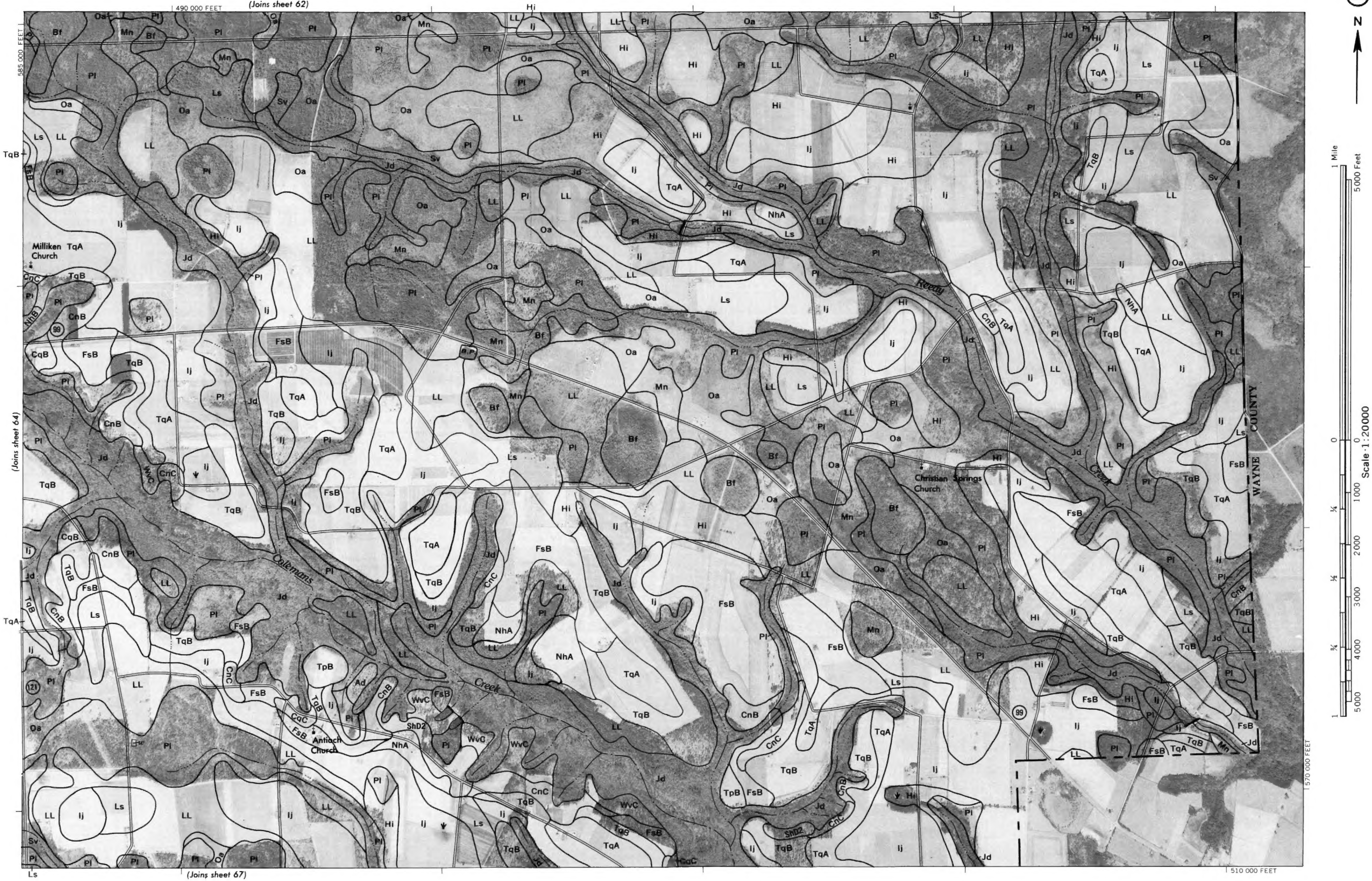

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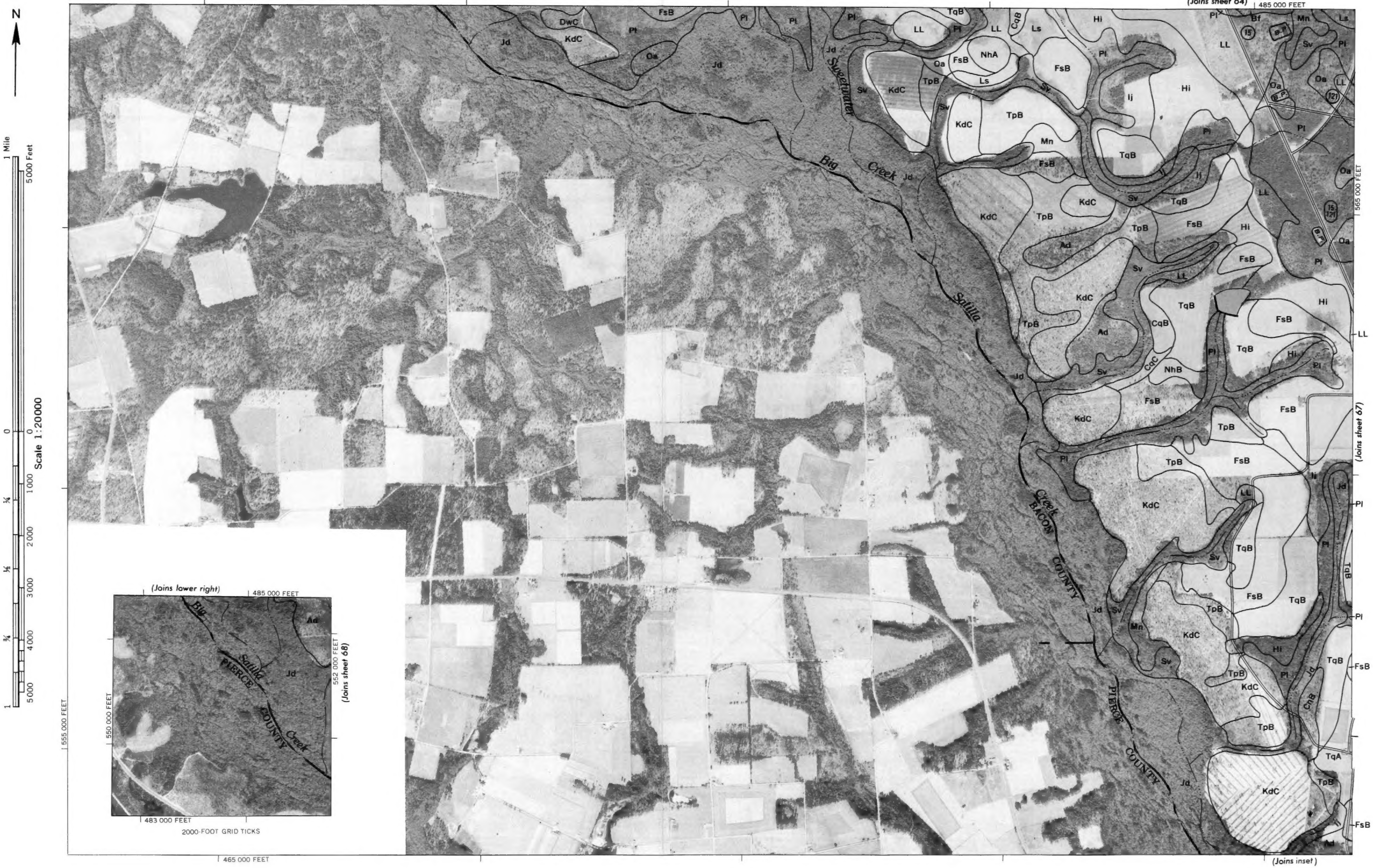

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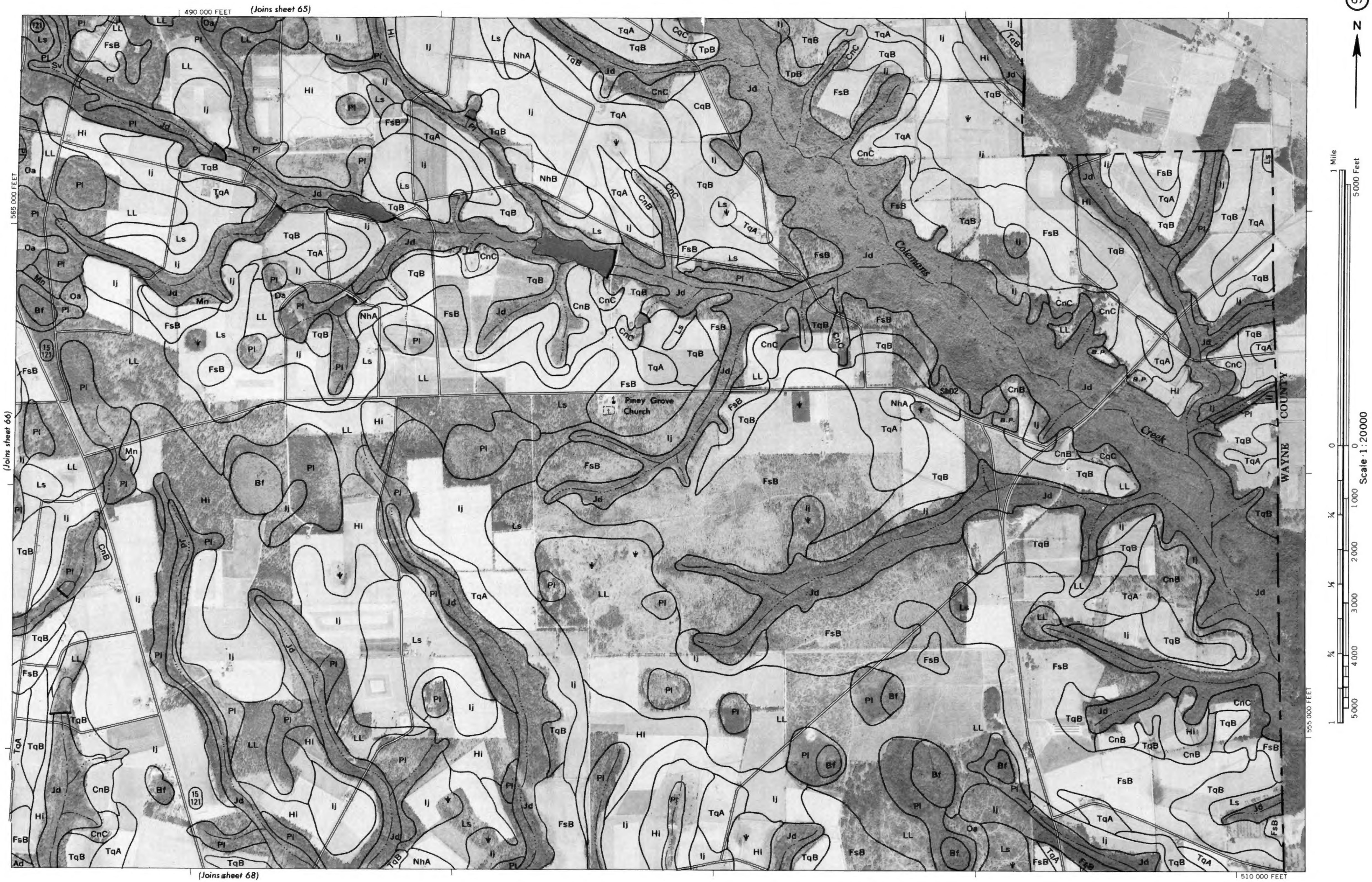

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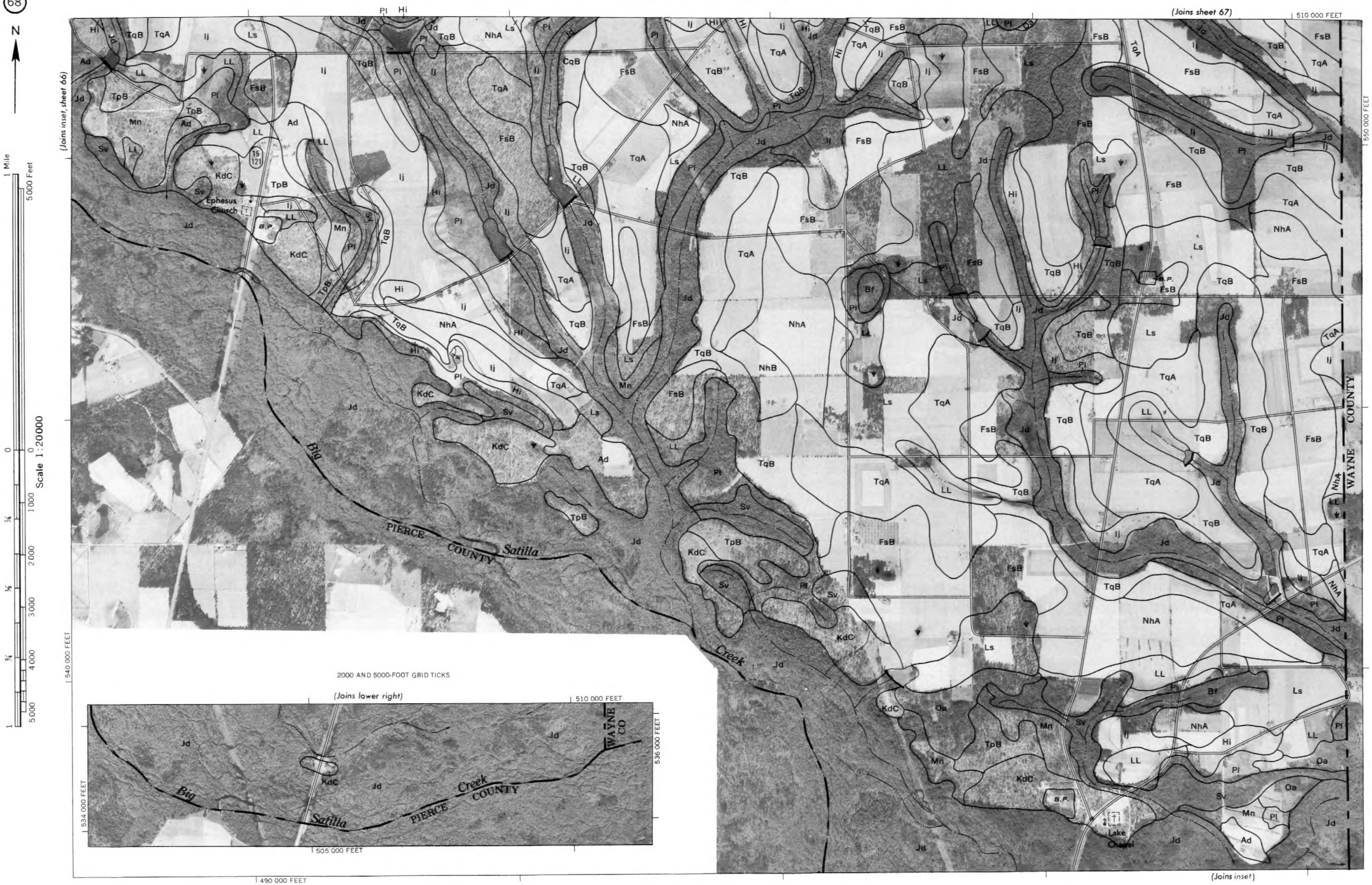

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